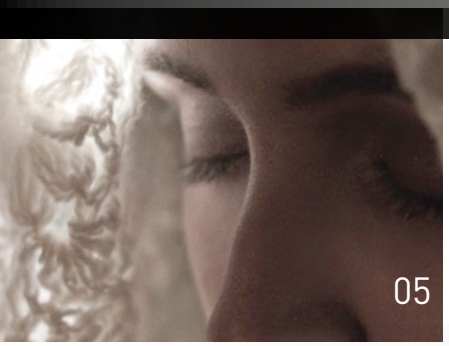
3lux:letters

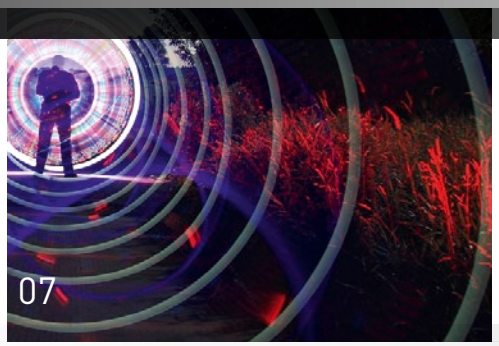
NEW LIGHT | ARCHITECTURE | TECHNOLOGY 1 | 2012 TRILUX

lux: Light keeps the rhythm
Designing for dementia patients

lux: Light for good health
The power of good lighting

lux: Light in practice
The TRILUX Academy in Arnsberg





Cover: Attractive lighting design creates a welcoming atmosphere in the atrium of the Orbis Medical Center.

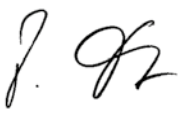
Photo: Boris Golz, Arnsberg

Dear Reader,

Discussions about the healthcare sector these days are often dominated by the issue of costs. Doctors and nurses are demonstrating against long hours and inadequate pay, while the rising cost of medication and treatment is reflected in health insurance premiums and prescription charges. In the design and construction of new hospitals and care homes, too, cost savings and tight budgets are the order of the day. And yet, among the factors that determine a patient's chances for a speedy recovery are not just the expertise of doctors and nurses, together with the necessary technical equipment, but also the quality of the physical environment. The atmosphere of the building, and not least the lighting situation, can contribute significantly to the well-being of hospital patients and care home residents.

With this issue of 3lux:letters, dedicated to the subject of "Light and Health", we hope to inform you about the possibilities and requirements when designing for the healthcare sector. In this, we have chosen to focus specifically on the design of care facilities for dementia sufferers. In our lead article, "Light keeps the rhythm", the architect and founder of Dementia Support Stuttgart highlights the particular needs of dementia patients and provides practical examples (page 10). The Bad Münder (page 22) care home serves as a case study to illustrate the positive effects that a carefully designed lighting concept can have on the lives of dementia sufferers. In hospitals, too, for example the Albert Schweitzer Ziekenhuis in Dordrecht, NL (page 26), patients stand to benefit from the competent application of lighting design, especially if combined with aesthetically pleasing architecture, as mounting evidence suggests that an attractive environment can accelerate the healing process. The Orbis Medical Center in Sittard, NL (page 30), combines hospital, medical centre and research facility in one building – an integrated approach that has also been implemented extremely well architecturally. In our "Interview" feature we ask experts how they approach designing with light in a healthcare environment, including how they deal with the thorny issue of cost (page 18). Our "Designer's Question" (page 37) explores the circadian rhythm and how it affects our own biological clock. And in the "Materials" section (page 36) we showcase a luminaire that uses intelligent technology to support this rhythm by mimicking natural light patterns. Finally, we introduce you to the new TRILUX Academy (page 40) and the "Medical Cube" (page 38) at our head offices in Arnsberg.

We hope you enjoy reading this latest issue of 3lux:letters.



Yours sincerely,
Thomas Kretzer, CEO TRILUX Vertrieb GmbH

LIGHT AND HEALTH

Endless light: neon lights and their reflections within a geometrical shape create seemingly infinite depth of space.

Think outside the box
Brigitte Kowanz
Museum Ritter, Waldenbuch
to 15th April 2012
www.museum-ritter.de

Unfathomable space: the arrangement of reflective exhibits causes the viewer to become part of the artwork.

The exhibition "Think outside the box" by Austrian light artist Brigitte Kowanz shows work that "thinks around the corner" – and this is also the sense the viewer gets when experiencing these installations. Brigitte Kowanz combines light, mirrors and writing to great artistic effect. In this, she places little importance on legibility – what matters to her is the visual quality of the words and letters in themselves. Her work takes the viewer into a world where light and reflection create infinite spaces. The artist plays with fluorescent lighting and Morse code and also draws the viewers themselves into her work, whose reflections merge with the art and become part of the installation. The exhibition at Museum Ritter in Waldenbuch continues until 15th April 2012.

Photos: VG Bild-Kunst, Bonn

The "foot light"

multi-bed hospital rooms, a quiet and peaceful environment is particularly important. To avoid disturbing sleeping patients in the same room, the "foot light" has been developed especially for use in hospitals. This flush-fitted wall light does exactly what its name suggests: it lights up the floor around the patient's feet, so they can find their slippers during the night without having to turn on the main lights. And, of course, nurses also benefit from this permanent indirect light fixture, which helps them carry out their duties at night and find their way safely along dark hospital corridors. Fitted to the wall at a height of about 20 to 40 centimetres, the light is directed towards the floor by a louvre panel. Simpler versions of the current models have been manufactured by TRILUX since 1971. In the early 1990s, the foot light range was expanded and is now available in a horizontal and a vertical version, with or without power socket. The luminaire body is made from white die-cast aluminium and is suitable for concealed or hollow-wall installation.

The foot light has been helping hospital patients and staff find their way at night since 1971.

Photo: TRILUX

The Trap Light is available in two different colour combinations and as a ceiling or floor lamp.

The lamp body is made using the traditional Murano glass-blowing technique.

A new form of light recycling has been created by designers Gionata Gatto and Mike Thompson. The "Trap Light" presents itself as a simple glass body, hand-made using a traditional glass-blowing technique, and set within a hardened-wire frame. Inside the glass are photoluminescent pigments that absorb waste energy from other light sources and emit this as visible light in the dark, even after all other light sources have been switched off. Photoluminescence can generate up to eight hours of soft, atmospheric lighting from just thirty minutes of input from another bright light source. With the Trap Light, its designers have created a unique, innovative energy-saving luminaire by combining existing, tried and tested technology with a new creative concept.

Trap Light
Gionata Gatto and Mike Thompson
www.traplightsaveenergy.com/

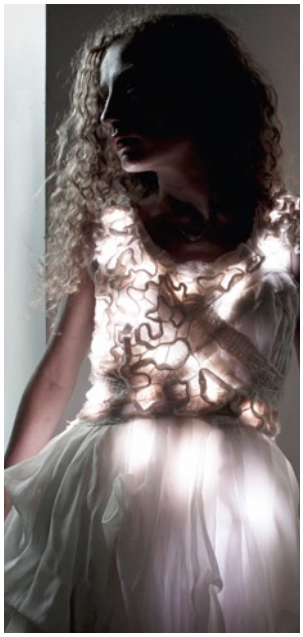
Light pigments inside the Trap Light create atmospheric lighting effects.

Photos: Gionata Gatto & Mike Thompson

Photos: Mary Huang / Michael Sun

Mary Huang's luminous clothes are like translucent works of art.

Rhyme & Reason
Mary Huang
www.rhymeandreasoncreative.com



For her Rhyme&Reason collection, the artist chose raw silk, cotton jersey and hand-crocheted lace as materials.

Is it possible to make clothes from light? The Rhyme&Reason collection by American designer Mary Huang definitely seems to answer this question with a resounding 'yes'. Rather than creating designs based on the LED lights themselves, the artist plays with the effects of the light they emit. Dozens of tiny LED units are sewn into the white flowing gowns, made from translucent fabrics such as raw silk, cotton jersey or hand-crocheted lace. The effect this creates is most intriguing, especially at night time: the clothes appear as if they are indeed made from light itself. The lights are powered by lithium-ion batteries, which last for up to eight hours before the magic subsides and the illuminated party dress needs to be recharged.

Photo: Boris Golz

light+building

Around 180,000 visitors are expected at this year's light+building exhibition. The show offers them an opportunity to talk directly to the experts. (Photo: the TRILUX stand in 2010)

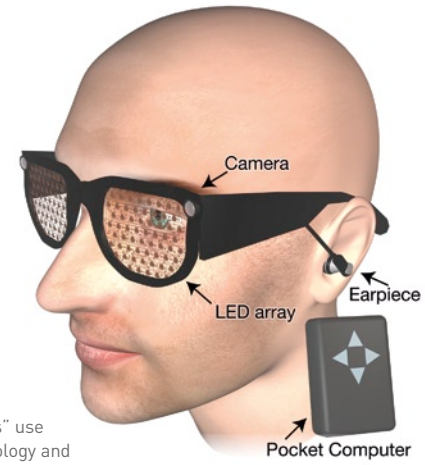
light+building
15th to 20th April 2012
Messe Frankfurt
Frankfurt am Main
One-day ticket 14 € / 16 €
Six-day ticket 30 € / 35 €
www.messefrankfurt.com

At the light+building exhibition in April 2012 in Frankfurt, more than 2,100 international manufacturers will be showcasing their latest innovations in the field of light, electronics, intelligent buildings and construction software. This year's key themes at the world's biggest trade fair for light and building automation are energy efficiency and the digitalisation of light and buildings. At a time of financial and environmental prudence, energy-saving innovations are at the forefront. The building of the future will resemble a mini power station, creating and storing its own energy. The exhibition, which takes place every two years, is accompanied by the Frankfurt Luminale – a public festival of light with evening displays in and around Frankfurt.

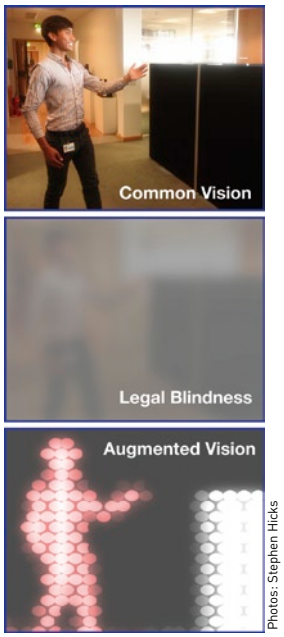
Bionic glasses for poor vision
Stephen Hicks
University of Oxford
www.smart-specs.com

In order to enable people with severe visual impairment to live a more independent life, neurobiologist Doctor Stephen Hicks, together with his team at Oxford University, is developing a special set of LED spectacles, based on the same technology that is used in smartphones and video games. Two tiny video cameras combined with depth sensors, similar to those normally found in games consoles, record the environment, while an integrated mini computer analyses the images using face recognition and tracking software. Relevant information is then displayed in low resolution on the inside surface of the transparent LED glasses. Doctor Hicks expects the bionic LED spectacles to be available at an affordable price from 2014.

Many visually impaired people have very limited spatial perception. Specially developed LED spectacles can help give them greater independence.



The "bionic glasses" use smartphone technology and include an inbuilt video camera and mini computer.



Photos: Stephen Hicks

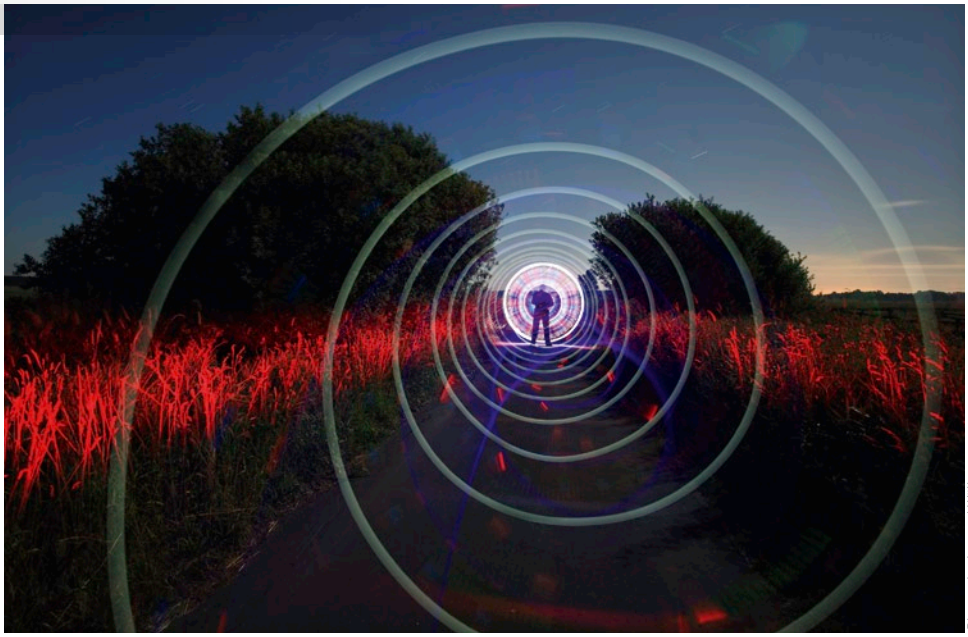
Mischa Kuball: mies-mies
29th October 2011 to 31th March 2012
Art Museum Celle with Collection Robert Simon
www.kunst.celle.de

The interrelationship between light, space and architecture is the focus of a special exhibition at the Art Museum Celle.

Photos: Urs Müller

The "mies-mies" exhibition by international concept and media artist Mischa Kuball is based on the artist's ongoing exploration of Mies van der Rohe's 1929 World Exhibition pavilion in Barcelona. Kuball has created a profound reflection on the interaction between light and architecture. Even the museum building itself becomes part of his installation: using a two-way circuit the artist introduced a slow, flowing up- and downwards movement to the bright-white illumination of the glass foyer. It almost appears as if the building is breathing. Within the exhibition itself, space, time and light converge, creating intense experiences for the viewer. The exhibition with its intriguing light installation is showing at the Art Museum Celle until 31st March 2012.

In 2007, photographer Jan Leonardo Wöllert began experimenting with night illuminations at a derelict warehouse site near Bremen harbour. From this, a series of remarkable images has emerged.



Photos: Jan Leonard Wöllert

Light art photography workshop
25th to 26th February 2012 in Würzburg
www.rgb-fotoschule.de
17th to 18th March 2012 in Nürnberg
www.fotodialoge.com
23th to 25th March 2012 in Seeheim
www.sigma-foto.de

www.lightart-photography.de

Bremen-based light art photographer Jan Leonardo Wöllert takes the meaning of the word "photography" literally and is drawing with light. Better known under the name of LAPP-PRO for the Light Art Performance Photography he perfected together with his colleague Jörg Miedza, the artist discovered this unique type of "light graffiti" almost by accident, when he walked past the open shutter of a long-exposure camera while carrying a floodlight. He realised that, by combining long exposure times and precisely choreographed illuminations in the dark, you can create shapes and figures in light that look like stunning, colourful paintings. For anyone interested in learning the technique behind this fascinating symbiosis of art and photography, the artist himself is offering introductory workshops in Würzburg, Nuremberg and Seeheim (see left-hand column).

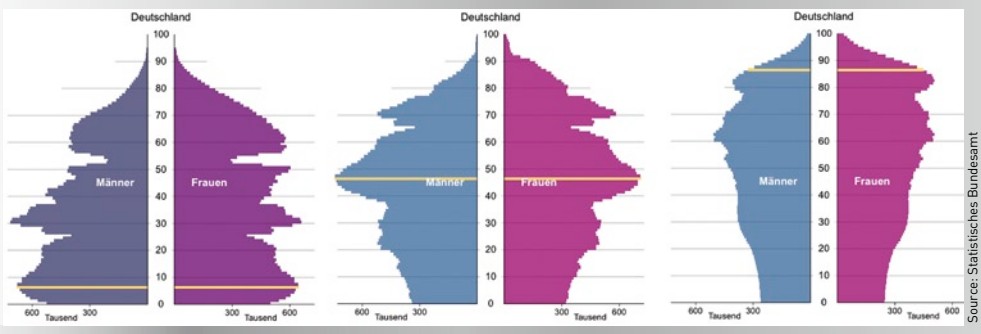
lux: STATEMENT

Elisabeth Schneider-Grauvogel,
WiA - Wohnqualität im Alter, Cologne

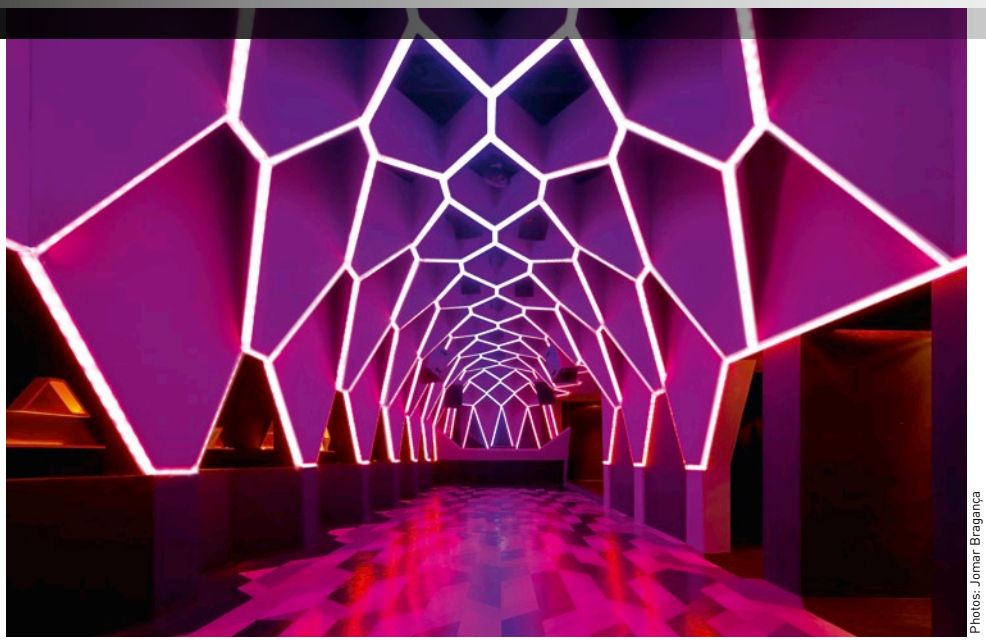
Throw out the rule books – we're getting old!

As a result of the changing age structure in many European countries, the traditional age pyramid is beginning to look more like a mushroom rather than a pyramid. With an ageing population also comes an increase in dementia sufferers. According to the latest statistics, an average of 1,300 people out of 100,000 are affected. Dementia, however, represents a challenge for us all: in our individual interactions, in the public realm, and also when designing interior spaces. Light plays a very important role here. It is not just a matter of enabling good orientation and providing sufficient light for older people to see properly. Once you look at the biological function of light in supporting and balancing our circadian rhythm, the importance of good lighting design becomes even more pertinent. There are already many excellent initiatives focused on optimising energy efficiency. But how do you approach the lighting design of a care home where over 70 per cent of residents are suffering from some form of dementia, and all the usual design rules no longer apply? Dementia means that knowledge, understanding and cognitive ability is lost, orientation relies on intuition alone and draws its cues from familiar, life-long habits and individual past experiences. A dementia sufferer is no longer able to learn and adapt to a new situation. On the contrary: unfamiliar situations are likely to cause fear and anxiety. This means that the lighting design has to convey comfort and homely familiarity while still being bright enough to accommodate for age-related visual impairment. At the same time, the potential for misinterpreting the space, for example through extreme changes between light and shade, has to be minimised. Where possible – or even essential – equipment must be operable by the dementia patients themselves. Where necessary, technology must be discreetly augmented to support those needs. There are still many unresolved questions and challenges for designers. One thing, however, is clear, and is the starting point in all our work: dementia sufferers still have a heart and a soul.

Bottom:
Diagram showing, by way of example, the demographic development of the generation born in 1964.



Source: Statistisches Bundesamt

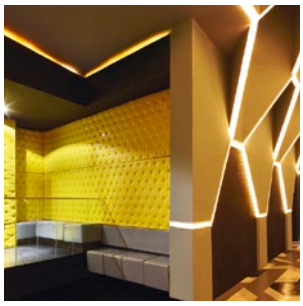


The illuminated honeycomb ceiling of the foyer conjures up the image of a beehive.

Photos: Jomar Bragança

Josefine/Roxy Club
Architecture and Light design
Fred Mafra.
Savassi/Belo Horizonte
Brazil

Behind the black façade of the Josefine/Roxy Club in Belo Horizonte, Brazil, clubbers are treated to a unique blend of architecture and lighting design. In redesigning this nightclub, completed in 2011, architect Fred Marfa has banished right angles completely. Across the entire 955 square metres of the club, and down to the smallest detail, the architect used exclusively asymmetrical shapes. Even the wallpaper was designed specifically, drawing inspiration from the 1970s disco era. To the beat of techno and electronic music, images are transformed through pixel mapping and projected onto LED strips along the edges of the different-sized hexagons on the walls and ceilings. The club sports two dance floors, three bars, four VIP areas and a lounge – and offers an extraordinary spatial experience.



The VIP area of the Josefine/Roxy Club sports yellow padded-vinyl walls.

Solar panels on the south-facing façade supply the "energy-plus building" with sufficient electricity.

The new customer service centre of the Stadtwerke Konstanz (Constance Municipal Works), completed in 2011, is a simple four-storey cube, which reveals its full brilliance especially at night. Integrated into the façade panels are LED units that light up in different colours to match the theme of the current event. The exhibition spaces and publicly accessible areas share the building's 800 square metres of floorspace with twenty workplaces. Each side of the cube is 15 metres in length and clad with a double-skin glass façade. The space between the two glass skins insulates the building in winter and also accommodates the louvres of the sun shading system. The south façade is equipped with photovoltaic cells which generate the electricity for this "energy-plus building".

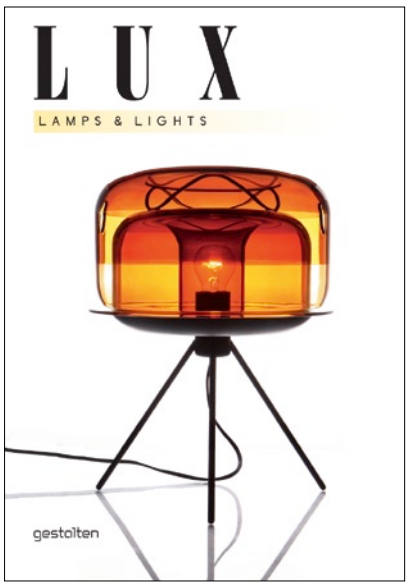
Customer service centre of the
Stadtwerke Konstanz
Max-Stromeyer-Str. 21-29
78467 Konstanz
Architekt: Arnold Wild
Façade design: Gerhard Weber
& Partner GmbH

The façade lights up in different colours according to the type of event taking place within.

The opaque façade panels are 3 x 4 metres in size, and are lit up from inside by LED units.

Photos: Patrick Pfeiffer and Inka Reiter

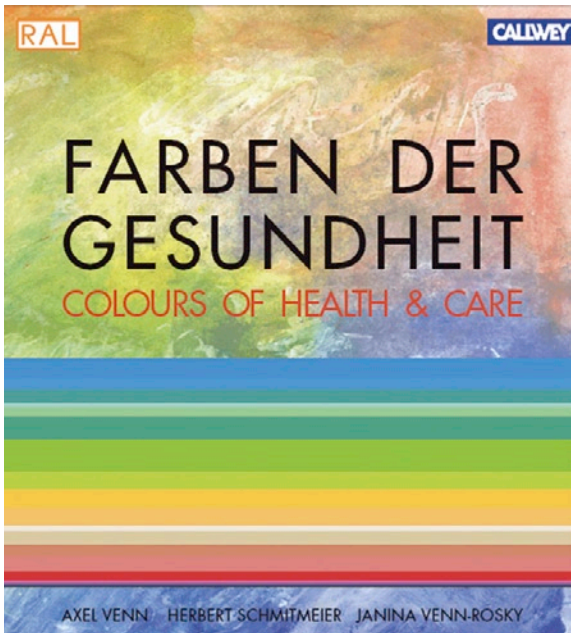
LUX
Lamps & Lights
Robert Klanten, Kitty Bolhöfer, Sven Ehmann (editor)
Published October 2011
by Gestalten, Berlin
320 pages, full color
17 x 24 cm, hardcover
English
€ 29,90 | $ 48.00 | £ 27.50
ISBN 978-3-89955-373-4
www.gestalten.com



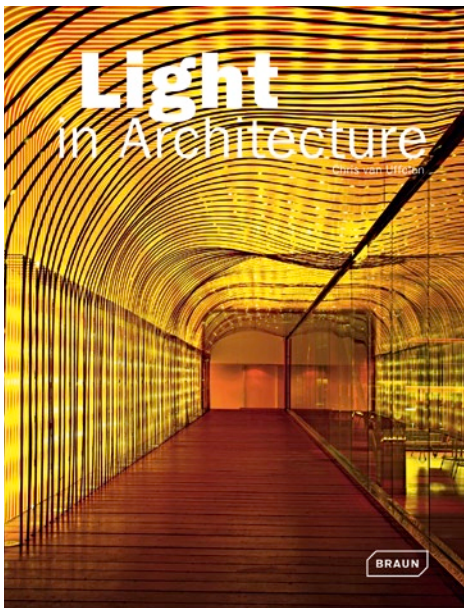
Lighting and light sources are an inexhaustible subject in design. This book presents more than 200 lighting projects, many of which rise to the challenge of the post-incandescent-light-bulb era and experiment successfully with alternative light sources. Without categorisation or explanatory text to help the reader understand the rationale for their selection, however, the book is really just a simple, if enjoyable, picture book – an eclectic compendium of lighting devices, their product names and the names of their designers. Only in the appendix, somewhat clumsily sorted by first name of the designer, do we find detailed information on the designs, together with technical data and supplier contact details.

Farbe der Gesundheit/Colour of Health & Care
Axel Venn, Herbert Schmitmeier, Janina Venn-Rosky
Published December 2011
by Verlag Georg D. W. Callwey GmbH & Co. KG, Munich
448 pages,
more than 7.000 illustrations
24 x 26 cm, hardcover
German/English
€ 70,00
ISBN 978-3-7667-1850-1
www.callwey.de

Colour can evoke different emotions and influence our mood. In the healthcare sector, an understanding of these effects enables designers to enhance patients' well-being. But which colours and hues do we perceive as "healthy" or "sick", as "stimulating" or "relaxing"? In order to answer this question, 70 research subjects aged between 18 and 83, were given 120 adjectives and asked to express them through colour. The results show that the desired effects can be achieved only by using different colours and hues in combination. The full study results have been compiled in this impressive volume, creating a comprehensive reference manual to support designers in their colour choices. Examples from real projects demonstrate the effects of different colours and their concrete application.



Light in Architecture
Chris van Uffelen
Published October 2011
by Braun Publishing, Salenstein, CH
424 pages, 900 illustrations
22,5 x 29,5 cm, hardcover
English
€ 78,00
ISBN 978-3-03768-092-6
www.braun-publishing.ch



Le Corbusier considered light, along with shadow, walls and space, as the most important architectural element. Reason enough to dedicate an entire book to the subject of light. On more than 420 pages, Light in Architecture celebrates international architectural projects that use light to create extraordinary spaces. Examples range from museums, restaurants and residential buildings to temporary architecture and façade lighting. Two to four pages are devoted to each project, with large-format photographs and detailed floorplans, as well as a short project description with key data, such as location and type of lighting used. Full contact details of the architects and designers are given in the appendix. An inspiring collection of selected lighting designs from recent years.

LIGHT KEEPS THE RHYTHM

There is no cure for dementia, but certain external measures can be deployed to make it more bearable for those affected. Daylight is an important factor and, as older people often lack exposure to natural light, their sleep-wake cycle becomes disrupted. Supplementing daylight through specially adapted artificial lighting can give dementia sufferers more restful nights and calmer days.

By Sibylle Heeg

Photos: Becker Lacour, Frankfurt

In 2000, around 25 per cent of the German population was over 65 years old. By 2040 this figure will have risen to 50 per cent. For the construction sector this means an increase in projects such as retirement homes, residential care homes and facilities for dementia sufferers. Ambitious architects and designers strive to create high-quality architecture despite the many restrictions, regulations and requirements. It is important to bear in mind, however, that high-quality architecture means first and foremost that it serves its users well and enhances their quality of life. Older people are extremely vulnerable, especially if their mind has become confused. A physical environment that is not designed to meet their specific needs in every way can pose huge problems – for the older person as well as for their carers. On the other hand, the built environment, and especially lighting, can also have many "therapeutic" benefits. And, considering that there is no effective medication for the treatment or prevention of dementia, this is a contribution that must not be underestimated.

Designing therapeutic environments

To be able to create a positive environment in care homes it is necessary to become aware of the situation dementia sufferers find themselves in, and understand the specific needs that arise from this. As cognitive abilities decline, the dementia sufferer's spatial competence diminishes and orientation within their immediate environment becomes more difficult. As designers we can compensate for this by making it easy for them to see and recognise objects and by providing good orientation and legibility, for example through appropriate lighting and colour design, simple, comprehensible layouts and by designing distinctive, clearly recognisable places.

The emotional situation of the dementia sufferer is also different. Many care home residents seek familiarity and closeness, they may be extremely trusting and treat us like close family members. Others may show behaviours that we find strange and challenging. They may be withdrawn, fearful or overly dramatic. They sleep during the day and are wide awake at night, wandering about restlessly. Or they may react aggressively for no apparent reason. Their condition alone is not always to blame for this, as this behaviour could simply be the result of an inappropriately designed environment.

If, on the other hand, the environment has been designed therapeutically, this kind of environmentally induced stress can be prevented and challenging behaviour reduced, which also makes life easier for the carers. Echoing rooms can be neutralised through sound-absorbing materials, open stairwells or tall rooms can be enclosed. An attractive corridor, designed as a continuous trail without dead ends, with occasional interesting

Corridors and seating areas in the "Fürstlich Fürstenbergisches Altenpflegeheim" facility in the Black-Forest town of Hüfingen have been fitted with soothing dark-red carpets.

places to sit and rest, and with visual connections to the outside world, offers patients who suffer from restlessness and agitation a place to wander about, always returning safely to their starting point. Non-obvious exits, disguised by wallpaper, prevent residents from inadvertently leaving the building and ending up locked out, banging on the closed door in frustration. Places that give access to natural daylight, for example a conservatory or naturally lit hallway, can help to stimulate the mind and lift the spirits, as well as balancing the circadian rhythm.

A further challenge is that, having moved from their own home into a care home, dementia sufferers suddenly find themselves in unfamiliar and alien surroundings. They cannot understand why everything is different from what they are used to. Often they just want to go home – maybe even attempting to walk there. It is therefore imperative to give them as familiar and comfortable an environment as possible by providing a friendly and homely atmosphere and a setting that allows them – or even encourages them – to personalise the space and make their own modifications, even if this involves doilies, cuckoo clocks or tassels.

Light as compensatory therapy

Increasingly, dementia experts consider light as a crucial therapeutic environmental factor. For designers who want to use light to address the aforementioned issues – compensating for impairments, therapeutically influencing behaviour and well-being, and providing a familiar environment – the task entails more than simply selecting the right type of luminaire.

Good lighting design starts with the floorplan layout – for example by avoiding corridors with rooms on both sides and windows at the gable end only. Rather, as much daylight as possible should reach right into the centre of the rooms. In a long dark corridor with insufficient lighting and only one light source at the far end, a dementia sufferer will see the friendly and familiar nurse coming towards him as a shadowy, dark and frightening figure. Uneven lighting is to be avoided as it causes deep shadows which are likely to confuse people with dementia.

Improving vision

A 60-year-old person needs three times the light intensity as a 20-year-old to perform the same visual task. For an 80-year-old the light intensity needs to be five times as strong. This fact is compounded in care homes, where the proportion of people with visual impairments is likely to be higher than amongst people of the same age who still live in their own homes. Poor lighting in care homes is therefore entirely unacceptable, as it

leads to loss of independence and increases the risk of falls. The recommendation is about 500 LUX at eye level, more in areas where more taxing visual tasks are performed.
The best way to support good vision is diffuse, indirect lighting which minimises shadows and avoids glare or reflections on the floor. Using an uplighter that is reflected from a pale-coloured ceiling is much more effective than the downlighters, so popular with architects. Bright indirect lighting, however, is an unfamiliar feature in a home environment, and it is advisable to include some additional location-specific ambient lighting to create a more homely atmosphere.

Circadian lighting

Light is not only important in order to see well, it also has significant physiological benefits. Our body clock needs the rhythm of natural daylight to regulate melatonin production and to balance our sleep-wake cycle. Older people living in care homes often lack exposure to daylight, as a result of staying mostly indoors and, in some buildings, lack of access to natural light – especially in the hallways and corridors, i.e. areas where dementia sufferers spend much of their time. This, combined with age-related reduced light transmission of the eye, means that these people effectively live in a permanent "biological night". Using circadian lighting to alleviate sleeping disorders, such as drowsiness during the day and restlessness at night, is therefore an obvious choice. And this was also the aim of a study led by the author, which examined the therapeutic effects of circadian lighting on dementia patients suffering from insomnia and restlessness.

Light therapy and dementia

In the design of a new extension building for a care home in Hüfingen (architects: GSP, Stuttgart) particular attention was paid to the therapeutic benefits of colour and lighting, especially in the corridors. Carefully placed wall lights provide mainly indirect, well-balanced lighting without confusing shadows. In addition, the lights were programmed to match the pattern of daylight in colour temperature (k) and light intensity (lx). This is known as "circadian lighting".
The designers hoped that this lighting concept would help normalise residents' sleep-wake cycle, reduce agitation and restlessness and improve their mood and motivation. The results, in particular the effect on residents' sleep patterns, were monitored through surveys of staff and family members of residents, interviews with senior staff and observation of the residents themselves. Evaluation of the monitoring data showed a clear correlation between the different lighting scenarios and changes in sleep patterns. Restless-

Linoleum flooring in natural tones creates a bright and friendly atmosphere in the treatment rooms and communal areas of the "Isarwinkel" rehabilitation clinic in Bad Tölz.

ness at night was more pronounced during periods when no circadian lighting was used (but only standard lights at approximately 200 LUX). Once the residents were again exposed to the specially adapted lighting, they experienced more restful nights throughout.

The results of this study indicate clearly that restlessness at night and apathy during the day is not to be blamed solely on old age and dementia. Intelligent lighting technology can be an important ally in the treatment and care of dementia patients.

In the redesign and refurbishment of care facilities, options should therefore always be explored for giving residents access to sufficient natural daylight or adapting artificial lighting so it can supplement daylight. An attractive and easily accessible outdoor area, a conservatory or a façade design that optimises daylight penetration – especially in corridors and hallways – may incur higher upfront costs, but this is compensated by lower energy costs in the long run.

If exposure to sufficient daylight is not achievable by architectural means (for example in an old building) it is worth investing in a circadian lighting system, not least as it also improves the working environment for carers, as the experience in Hüfingen has shown. Energy savings can be made by including daylight sensors that automatically adjust output in response to natural light levels.

Sibylle Heeg

Born in 1944 in Innsbruck, studied architecture at Stuttgart University and subsequently worked there as researcher and lecturer in Infrastructure Planning. She founded a number of organisations dedicated to the subject of design and construction of social infrastructure facilities. Since setting up the "Gesellschaft für Soziales Planen" in 2003, Sibylle Heeg has been devoting most of her time to publishing and to the design of care homes for dementia patients. **www.sozialesplanen.de**

SCIENCE

Ever since Robert Koch discovered the tubercle bacillus in 1882, biologists have been tirelessly researching the causes of different diseases. A major scientific milestone was the Human Genome Project, which started towards the end of the last century and aims to decode and fully understand the human DNA molecule. One thousand scientists have been involved in the project worldwide and genetic analysis has now become standard practice in medical research. DNA quality control using UV light is just one of the steps involved in the complex process. Shown here is a researcher studying the Chikungunya virus, which is responsible for a tropical fever common throughout Africa, India and South-East Asia.

Photo: Patrick ALLARD/Rea/laif

“Science always involves persevering where others have given up, building on the foundations and frameworks that others have prepared. Unfortunately, this also means that sometimes it involves continuing someone else’s wild-goose chase.”

Hubert Markl, * 1938, German biologist, university lecturer and former president of the Max Planck Society

RELIGION

In 1858, a young girl by the name of Bernadette Soubirous witnessed at total of eighteen apparitions in the Grotto of Massabielle near the French town of Lourdes. She reported to have seen a "young lady" who told her to pray for the sinners and to drink water from the spring. Soon after, the first miracle happened: Catharine Latapie was able to move her paralysed arm after bathing in the spring water. Since then the grotto has been considered a sacred site and has become a famous place of worship and pilgrimage, with 7,000 "inexplicable" cures and sixty-seven officially recognised miracles. Holy mass is broadcast live on the Internet and the six million pilgrims each year represent an important economic factor for the region.

Photo: PASQUIER/Gamma-Rapho/laif

“It is life that, little by little, example by example, permits us to see that what is most important to our heart, or to our mind, is learned not by reasoning but through other agencies.”

Marcel Proust,1871-1922, French writer and critic

LOOKED INTO

3lux:letters asked three renowned lighting experts three questions on the subject of "Light in healthcare sector".

Prof. Hans Nickl
Architect
Nickl & Partner

No one likes spending time in hospital. All the more reason then to give hospitals a pleasant and friendly atmosphere. How do you use lighting in your work to make a hospital stay as pleasant as possible?

Prof. Hans Nickl: Light in architecture has always been a big subject for us – and it is especially important in the design of hospitals. Apart from functional considerations, aesthetics and emotion are important aspects in the healing process and can speed up recovery. Hospital design has to fulfil the whole range of architectural requirements, while also focusing on a number of special qualities, such as the quality of lighting and its changes throughout the day, but also haptic qualities. Our principal design approach is to enhance all patient areas through natural light. This also includes corridors and examination rooms as well as intensive care units and operating theatres. To allow as much daylight as possible into these rooms, we try to avoid window parapets in patient rooms and communal areas – or we design them so they can double up as seating.

Photo: Nickl & Partner

Clinical Centre of the Johann Wolfgang Goethe-University in Frankfurt am Main

Katja Winkelmann
Light planner
Licht01

Katja Winkelmann: As in most of our projects, in hospital design too, the climate and atmosphere of the rooms are our key design parameters. We divide the space into different zones and aim to create different moods. In the entrance and waiting areas, for example, we use a warmer and more differentiated lighting design than in the corridors. It is also very important to balance the interior lighting with the light situation outside, to ensure rooms are still pleasantly lit at night. Without this, lighting that works fine during the day will seem too bright and unpleasant in the evening. In hallways and corridors we like to use lighting systems that combine lower light intensity at night with a change in colour temperature (<2900K).

Matthew Placzek
Light artist
Placzek Studios

Matthew Placzek: My main objective is to create a pleasant environment for patients and their families. For this I use sculpture and light to make works of art that encourage interaction. In each piece, light and colour form a source of energy which benefits the healing process in a variety of ways. So, for example, the colour red stimulates circulation, while green calms the nerves and promotes healing in general. I enjoy designing healing environments with a wide range of colours that support the care, well-being and comfort of patients and their families.

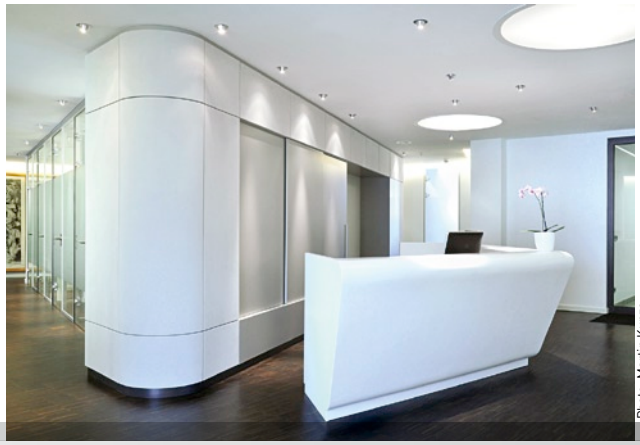


Photo: Martin Kunze

Orthopedics practice in Hamburg

Photo: Thomas Grady Photography

„Illumina", Century Link Center in Omaha

Healthcare costs have risen dramatically over the last few years. Does this still leave enough room for good lighting design?

Prof. Hans Nickl: When talking about costs you have to distinguish between upfront and running costs. The upfront costs have hardly changed much over the past few years. Unfortunately, however, we are finding that the demand for good design is virtually non-existent these days – and that has little to do with cost (in particular where lighting design is concerned). The question we should really ask is: what has led to this situation? Especially bearing in mind that the purely pragmatic approach has so clearly resulted in designs that don't work.

Photo: Nickl & Partner

Nursing home for the elderly in Titting-Eichstätt

Numerous studies have proven that good lighting design enhances well-being and therefore plays an important part in patients' recovery. Can you think of examples of hospitals or care homes where the lighting design has been particularly successful, and for what reason?

Prof. Hans Nickl: I can spontaneously think of two examples: one is a residential care home in Titting-Eichstätt. Even though the facility is 20 years old, all aspects of good lighting design have been addressed superbly. The second example is the Johann Wolfgang Goethe University Clinic in Frankfurt. Here, architecture and light art form a perfect alliance.

Prof. Hans Nickl,

born in 1941 in Marktredwitz, has over 40 years of experience in architecture and urban design, designing social housing as well as healthcare, research and educational buildings. Together with his wife, Prof. Christine Nickl-Weller, he set up the practice Nickl & Partner in 1989. Having taught at the TU in Munich for more than 15 years, and in addition to a professorship at the FH Erfurt, Prof. Nickl has been Visiting Professor at the TU Berlin since 2004. **www.nickl-partner.com**

Katja Winkelmann: Sadly, in hospital design, especially in the standard wards, lighting is often considered mainly from a quantitative perspective, rather than with regard to its quality. The only thing that seems to matter is achieving the illumination levels required by the relevant standards. Private hospitals or wards are a different story: here the emphasis is much more on quality lighting and on creating a positive atmosphere whilst adhering to technical standards and regulations. We also see a change in attitude in care homes and hospital wards for dementia patients. Again, here the emphasis is more on high-quality lighting design, considering not just the atmosphere the lighting creates, but also its biological effects on the human body.

Matthew Placzek: In the healthcare sector there has been a shift in emphasis towards evidence-based design. There is a growing awareness of the role of the physical environment in promoting well-being and healing. This change in priorities has also increased the design budgets where lighting design is concerned. Nevertheless, several of our projects have depended on private finance. For example, one healthcare institution recognised the importance of our design and how it would enhance the identity of the building. Private finance made it possible for our light and sculpture installation to be realised – with great success and much to the delight of patients and adjacent communities.

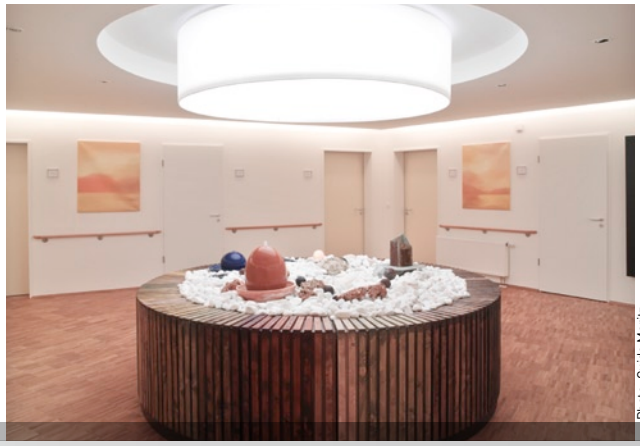


Photo: Guido Moritz

Katharina-von-Bora-Haus in Bilk

Photo:Thomas Grady Photography

"Imagine", Children's Hospital in Omaha

Katja Winkelmann: The Katharina von Bora care home in Düsseldorf-Bilk has a unique architectural concept: the corridors are not designed in the usual way, but form seemingly infinite "ambulatories" that open up into a larger space at regular intervals. Each of these spaces has a central object (herb garden, water feature,...) you can walk around before continuing to follow the corridor. For dementia patients, this ability to "wander" is extremely important. Large light sources use dynamic simulation to emulate natural daylight, which has a stimulating and motivating effect on the residents.

Matthew Placzek: The Children's Hospital & Medical Center in Omaha is an excellent example – a project that was rewarding for the architects and the artist, as well as benefitting the patients. The light-art objects are designed to promote well-being and healing and at night become a spectacular light installation. Colour and movement brings the umbrellas to life and instils a sense of joy and happiness in the young patients. These positive emotions, inspired by the artwork, help to make their hospital stay easier. For me, this alone is reason enough to have created this installation.

Katja Winkelmann,

born in 1967, trained as a draughtsperson, then worked in various design and engineering practices, before becoming a freelance lighting designer from 1991 to 2001 while studying architecture at HAW Hamburg, graduating in 1998. In 2001 she set up Licht01 together with Robert von Sichart. Katja Winkelmann also teaches at the AMD Hamburg. **www.licht01.de**

Matthew Placzek,

born in 1964 in Columbus/Nebraska (USA), studied art and art history at Hastings College in Hastings and Creighton University in Omaha. While still at university, he was already selling his work to several galleries. In 1990 he set up the design practice Placzek Studios. His work in wood, clay, steel and bronze is characterised by attention to detail and individual design. **www.matthewplaczek.com**

LIGHTING FOR A DIFFERENT WORLD

Light offers safety, alleviates fears and aids orientation. Its effect can be stimulating or calming. In care homes for people suffering from dementia, light plays a particularly important role, as it provides access to the world of those affected. At the MediClin residential care home in Bad Münder, TRILUX has created a lighting concept that is specifically designed to meet the needs of dementia patients.

By Marina Schiemenz

The external areas surrounding the care home in Bad Münder form part of a circular walk that continues through the building.

Client:
MediClin Deister Weser Klinik, Bad Münder

Architect:
MediClin GmbH & Co. KG, Offenburg

Location:
Lug ins Land 5, Bad Münder

Luminaire:
Acuro, Inperla, Onperla, Oleveon, SncPoint

Photos:
Boris Golz, Arnsberg

Light-coloured flooring helps alleviate fears, thereby encouraging movement and activity.

Light offers safety, alleviates fears and aids orientation. Its effect can be stimulating or calming. In care homes for people suffering from dementia, light plays a particularly important role, as it provides access to the world of those affected. At the MediClin residential care home in Bad Münder, TRILUX has created a lighting concept that is specifically designed to meet the needs of dementia patients.

Dementia is an umbrella term for more than 50 different types of cognitive disorder (including Alzheimer's). The symptoms may vary, but what they all have in common is the progressive deterioration of mental capacity. For dementia sufferers, only the here and now matters, as the disease destroys the bridges to things learned and experienced in the past. Often this is accompanied by extreme mood swings – from laughing uncontrollably to tearfulness, from ranting and shouting to whispering – baffling personality changes and loss of orientation. Architecture, interior design and lighting that is tailored to the needs of dementia sufferers can help make their everyday life easier and alleviate some of the effects of this terrible disease.

A good example of this is the new building of the MediClin residential care home Deister Weser in Bad Münder in Lower Saxony. The building houses two groups with fourteen residents each. "Many of our residents experience restlessness and agitation," explains care home director Sven-Uwe Gau. To accommodate this, corridors, communal rooms, entrance areas and even the garden have been joined up to form one continuous circular route. The sand-coloured laminate flooring was deliberately chosen in a light tone to encourage movement. Darker floor covering may be seen as a sheer drop; corridors and hallways with abrupt turns, too, can cause irrational fears in dementia patients. "Our residents won't move one step unless they can see where they're going," says Sven-Uwe Gau. At the exit, however, the designers have taken advantage of this fact: a dark, granite-like strip in the flooring creates a perceived barrier for those with severe dementia, thereby reducing the risk of patients wandering off by accident.

The communal room and kitchen uses subtle colour accents on the walls and blue-spectrum lighting to create a stimulating environment.

And not just the architecture and colour choices assist in making everyday life easier for dementia sufferers. A carefully designed lighting concept also enhances their well-being. "Optimised lighting in dementia care homes helps prevent falls, stimulates the senses, provides good orientation and thereby helps maintain patients' independence, dignity and self-respect," says TRILUX Sales Director Thomas Kretzer. The building itself and all external areas around it are therefore brightly lit. Visitors may deem this irrelevant or excessive, but for the dementia sufferers this is vital to create a sense of safety. For them, a shadow can become an insurmountable obstacle, moving patterns or shapes overtaking them can trigger panic attacks, and bright, reflective surfaces can look like treacherous puddles or ice patches.

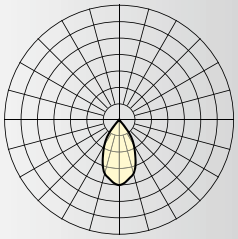
"But we want to achieve even more with our lighting concept," Sven-Uwe Gau reveals, "we also want the lighting in our communal areas to have a stimulating effect." All areas dedicated to active uses, such as the communal room and kitchen, therefore use lighting with a higher blue spectrum, which reduces production of the sleep-inducing hormone melatonin, thereby increasing alertness and motivation.

The colour design of the rooms, too, has been carefully chosen: walls in subtle blue shades, in contrast to the blue-spectrum lighting, have a calming effect and promote good sleep. Antique pink gives a sense of comfort and safety, while orange stands for optimism and enthusiasm for life and is therefore seen as motivating and depression-busting. The colour concept is complemented by matching TRILUX luminaires.

The integrated approach to the design of the new building benefits all – residents as well as visitors and staff. "The bright, pleasant lighting also means that our carers are more relaxed and motivated. And, in turn, this positive atmosphere also benefits our residents," Sven-Uwe Gau reports. The new MediClin care home shows how optimised lighting, together with a well-considered architectural design and a supporting colour concept, can help improve the life of dementia patients, their family members and their carers.

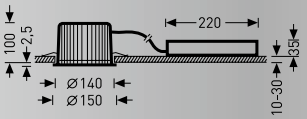
For dementia sufferers it is important to be able to see where they are going. All external areas are brightly lit after nightfall.

Inperla LED



Luminous intensity distribution

With its superb choice of different décors and trims the Inperla LED offers a wide range of individual interior design solutions.



The Inperla LED takes the TRILUX Inperla to the next level. Optimised light distribution means the Inperla LED achieves excellent illumination levels with fewer units, making it an ideal choice for general or ambient lighting in retail environments, foyers, corridors, offices, conference and meeting rooms, hotels and restaurants, as well as in a home setting. The neutral-white light has a colour temperature of 4000K and is also available in a DALI-dimmable version. The lamp body is made of galvanised steel plate with a silver-grey die-cast-zinc frame. Its technology may be highly sophisticated, but the Inperla LED is nevertheless extremely quick and easy to install without tools, thanks to its special "fast-fit" mechanism.

Joined-up healthcare

The hospital in Dordrecht in the Netherlands was substantially refurbished and further specialist units were added. A three-storey glass atrium links the buildings across the base of the new, ultra-modern complex. Brickwork is the common denominator that visually unites the buildings, while a shared interior design concept underlines their connection.

By Cornelia Krause

The extension to the north of the old hospital comprises a whole ensemble of buildings (bottom left). A glass atrium with healthcare facilities connects all the individual tracts (right).

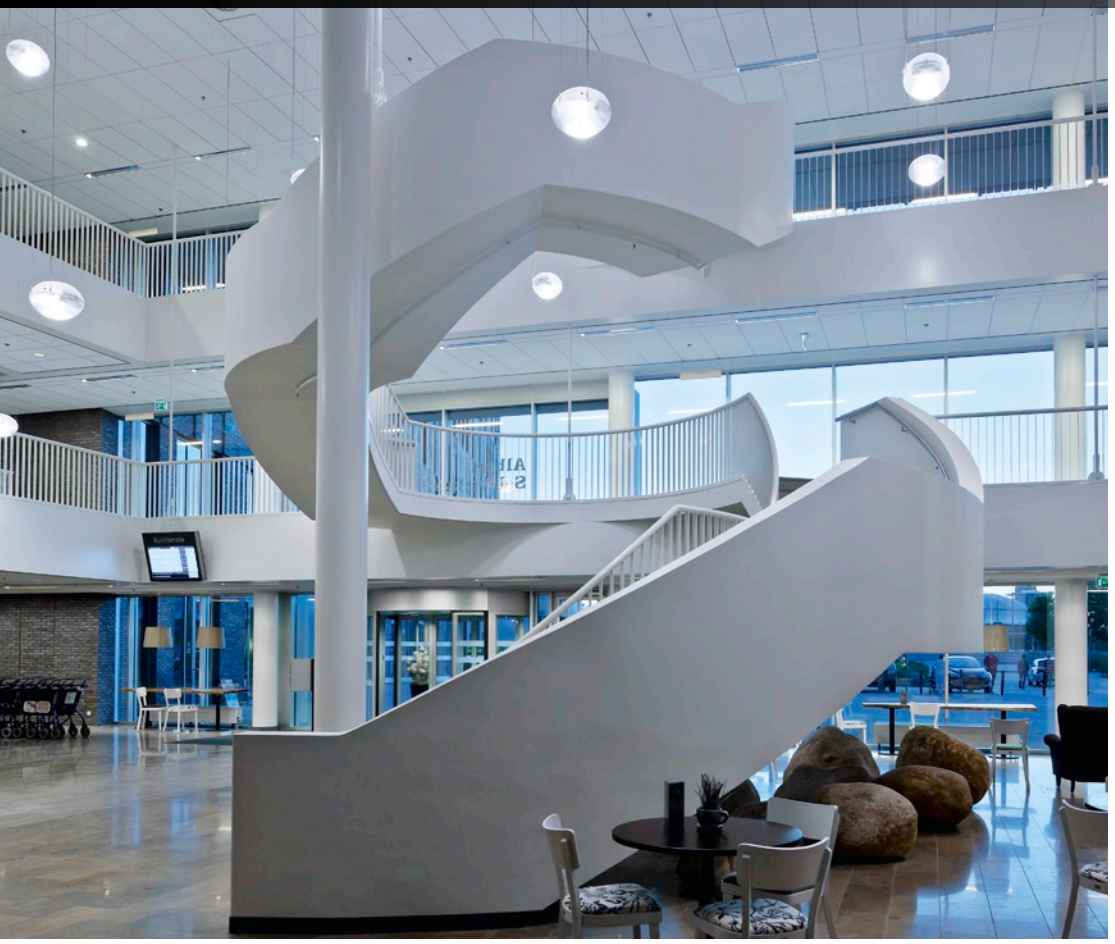
Client:
Albert Schweitzer Ziekenhuis

Architect:
EGM architecten, Dordrecht, Netherlands

Location:
Dordrecht, Netherlands

Luminaire:
Ambiella, Inperla, Inperla LED, Enterio PA, VS100

Photos:
Boris Golz, Arnsberg

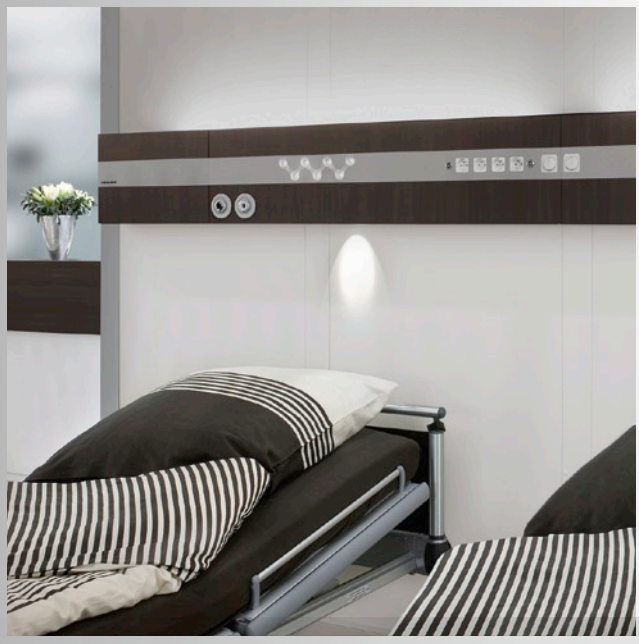


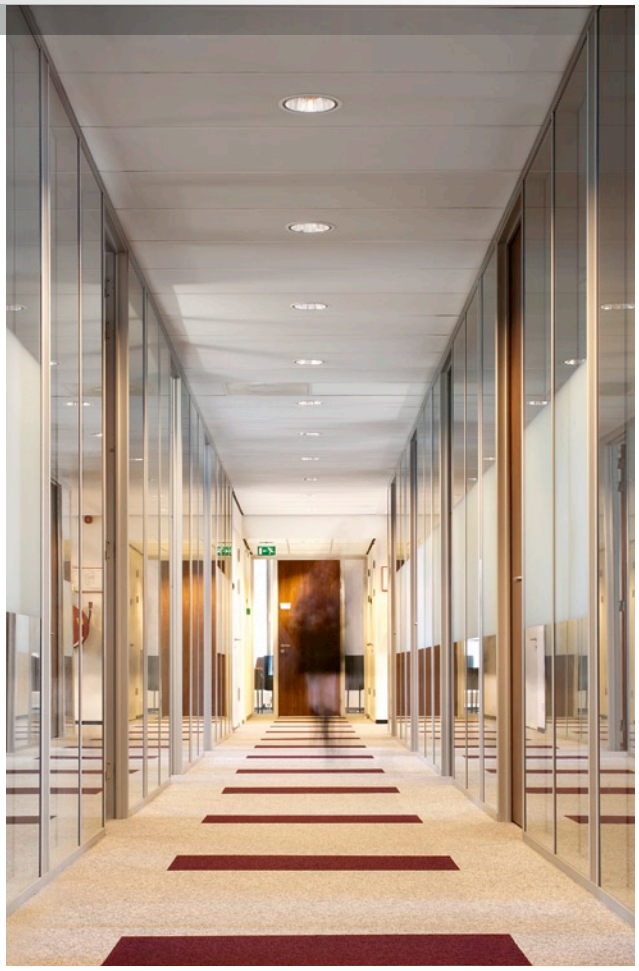
A spiral staircase with a sculptural quality creates a focal point in the entrance hall of the refurbished old hospital building.

VS 100/Nexim Med

The VS 100 is an installation system for hospital rooms that can accommodate all medical technology, from basic monitoring to complete intensive care unit systems. A wide range of accessories, such as control panels, drawers and equipment trays, can be added to the system. The unit can be wall-mounted horizontally or vertically. The TRILUX Medical range also includes the NeximoMed reading light. It consists of seven LEDs arranged in a distinctive knot pattern and provides direct, glare-free lighting to the hospital bed. The luminaire received a Red Dot design award for its elegant and innovative design, while its energy-saving LED technology helps reduce electricity bills.

The glare-free Neximo Med is a modern reading light for the healthcare and care home sector, which can be integrated with the VS 100 installation system.





The corridors connecting the consultation rooms and healthcare services use transparent partition walls to allow access to natural light.

Wall panels with nature motifs add a feelgood factor to the waiting rooms and communal areas.

The Dordrecht Health Park is expanding and now almost forms an entire district in itself. The existing Albert Schweitzer Hospital has been substantially refurbished and extended to become a fully fledged medical service centre. To the north, a new building complex provides additional services such as Accident & Emergency, Outpatient Unit, a Competence Centre and doctors' surgeries. Four main buildings rise up above the three-storey glass atrium that links all hospital tracts, old and new, across their base. The functional connection between the separate buildings is visually expressed in the vertical pattern of their façades. Nevertheless, each individual tract also has its own identity. The carefully chosen colours of the brickwork vary from warm ochre to bright vermillion red. The dark-grey vitrified brickwork of the perpendicular building stands out in that the glazed surface of the stone shimmers like metal when the light catches it at an angle. This prominent building also accommodates the main entrance of the hospital complex. Each individual tract still has its own entrance, of course, but on the inside they are all connected with each other to allow facilities to be shared in future. The building to the east contains a care home and care hotel as well as a maternity ward. The other tracts contain offices, a training academy, the Competence Centre and the South Holland district health department, which is located in the building to the far west.

n the evening hours the inside of the glass atrium lights up in a sequence of colours, from apple green to daisy yellow, bright enough to shine out towards the street. The continuous corridor is designed as a landscape. Floor-to-ceiling photo collages give the impression of walking along a riverbank. Different colours and materials create clear identities for the different departments. Waiting areas are designed to be welcoming and attractive, with views towards the outside, creating a warm and friendly atmosphere for patients and visitors. Individually designed lighting concepts for each unit further assist good orientation.

COMPREHENSIVE HEALTHCARE PACKAGE

Modern hospital design pays increased attention to creating a pleasant atmosphere that supports the healing process. But the Orbis Medical Center in the Dutch town of Sittard, designed by Bonnema Architects, goes a step further. The centre combines the advantages of hospital and medical centre under one roof, while an intelligent room layout creates the highest level of comfort for staff and patients alike.

By Johanna Niescken

The façade combines silver-grey cladding, red brickwork and backlit glass blocks to good effect. (Below). Generous stairways lead from the public atrium space to the different departments of the Orbis Medical Center. (Right)

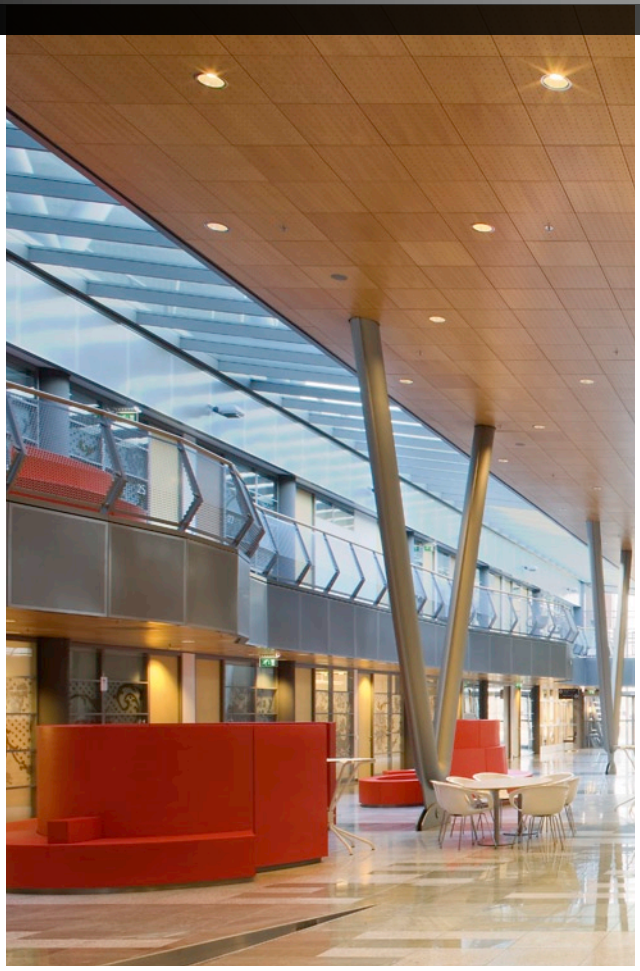
Client:
Orbis Medisch en zorgconcern, Sittard

Architect:
Bonnema Architects

Location:
Sittard, Netherlands

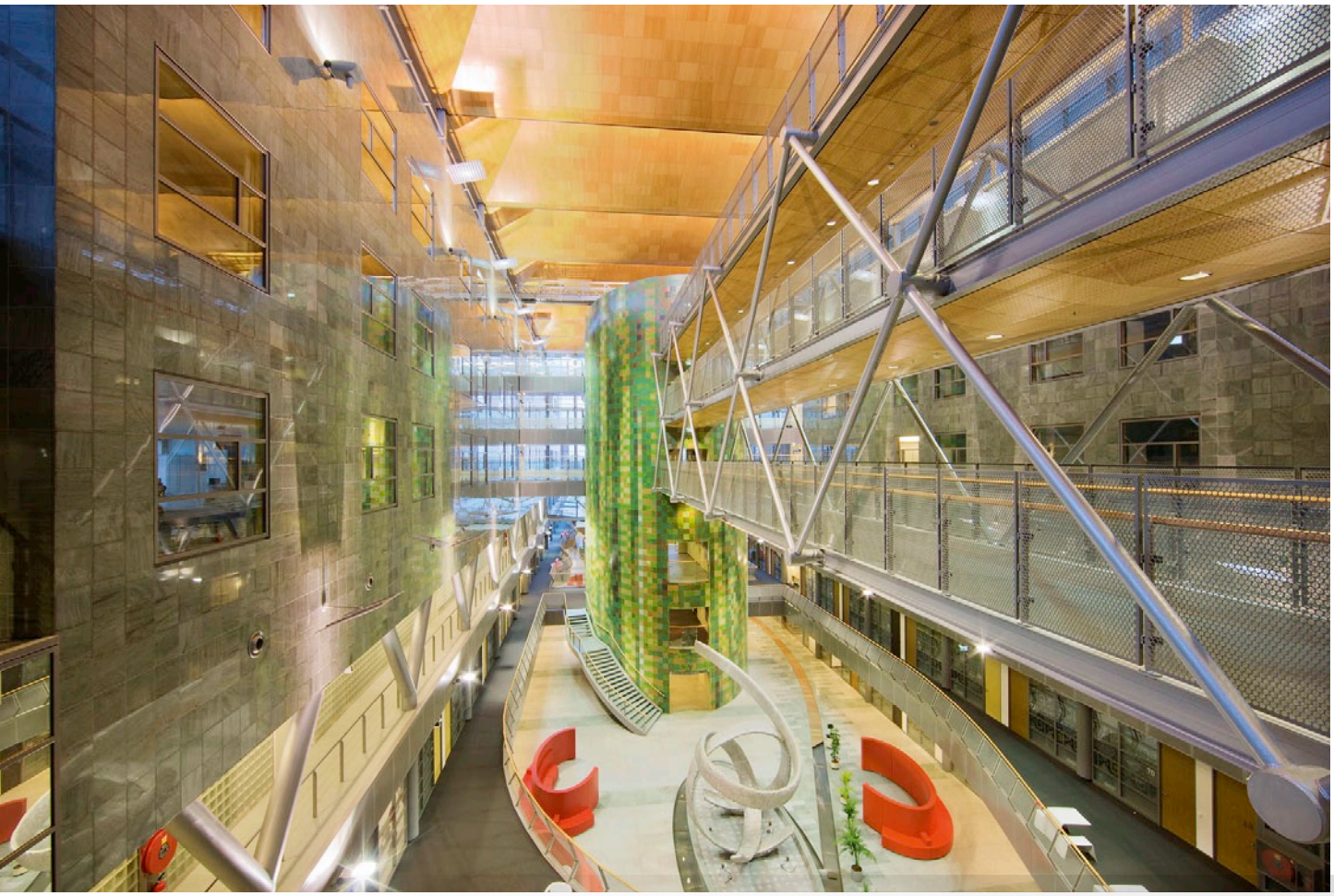
Luminaire:
Astron, Deca, Fidesca, Inperla, Luceo, Polaron, RaptorPlus, Scenic, Solis

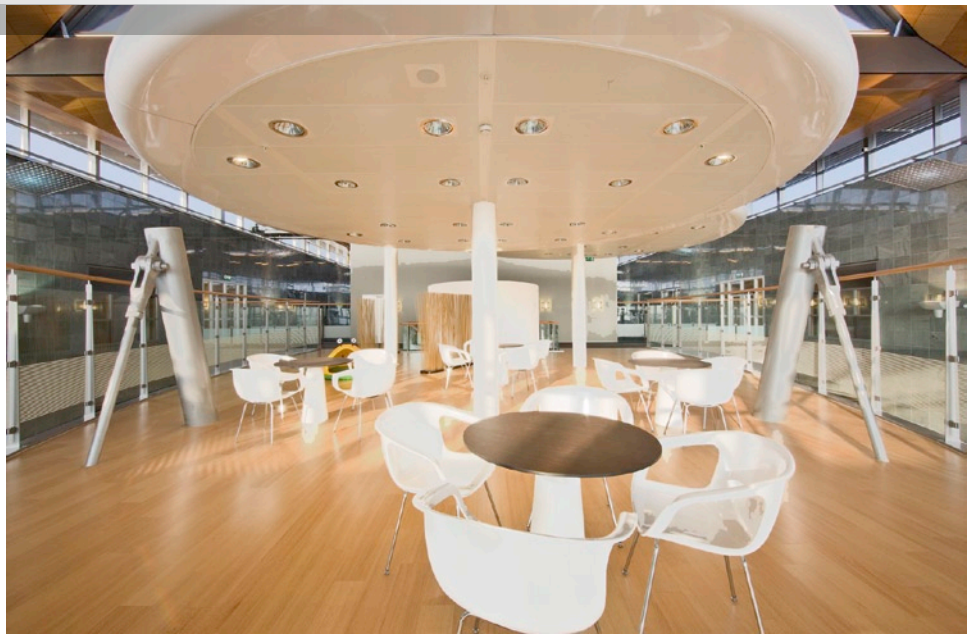
Photos:
Boris Golz, Arnsberg



Bright red seating units and the distinctive V-shaped supports create strong visual features within the atrium.

Mezzanine levels, overhead walkways and an attractive colour design give structure to the large space and divide it into distinct zones.



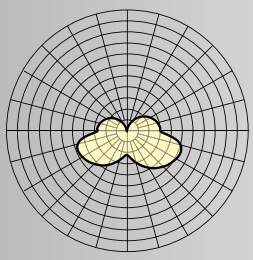


One of the mezzanine levels on the shorter window-side of the building accommodates a cheerful, generously designed cafeteria.

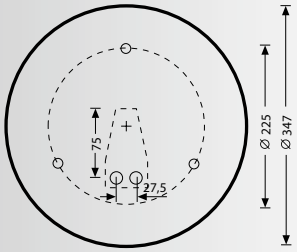
Polaron

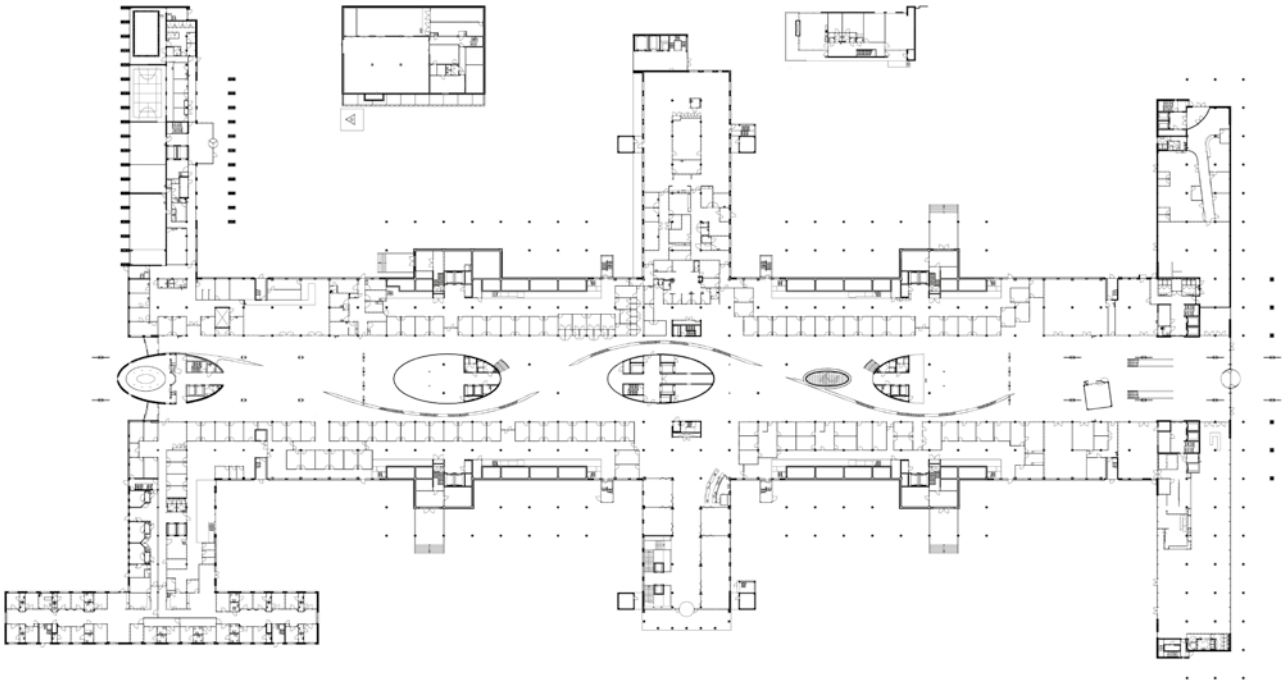
Whether recessed, semi-recessed or surface-mounted, the TRILUX Polaron luminaire is the perfect choice for foyers and other public interior spaces, as well as for the home. The Polaron gives a soft, diffused light and comes in a timeless design, which makes it an attractive feature even when switched off. The indirect lighting effect is created by a circular secondary reflector of white sheet steel. The design of the Polaron is based on the T5 circular fluorescent lamp, and different colour temperatures can be achieved using a version with two T5 circular tubes. The lamp body and casing is white powder-coated die-cast aluminium, with steel-plate fixings. The circular PMMA diffuser is screened towards the room by a white ring-shaped shield.

The Polaron combines impressive technology and attractive design in a versatile multi-purpose luminaire.



Luminous intensity distribution



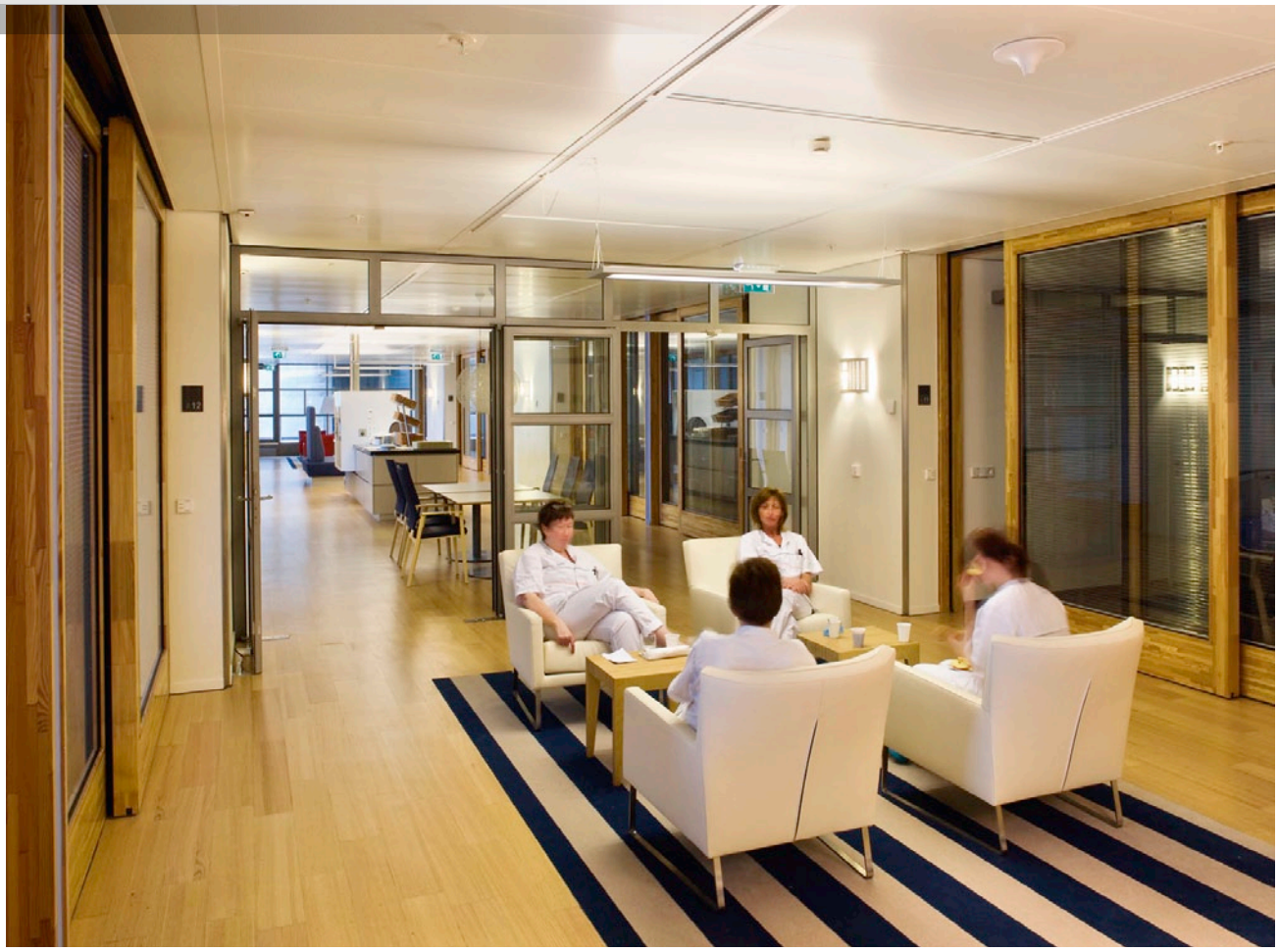


Floorplan of the ground floor

The Orbis Medical Center sets an example, not only in its state-of-the-art technical equipment and its responsible treatment of both staff and patients, it also excels in the quality of its architectural design. As a modern medical centre it combines hospital wards, doctors' surgeries and specialist clinics with a research and competence centre providing 350 jobs. With the Orbis Medical Center, the Dutch practice Bonnema Architects has created a highly advanced healthcare building, which, with 425 beds across twelve wards, eight operating theatres and one hundred consultation rooms, offers ample space for professional medical treatment.

The main entrance at the gable end of the building leads into a 265-metre-long atrium space. Clever zoning means that, despite its size, it does not feel overwhelming. The space serves as a central meeting and distribution point. Daylight enters partly through the façade on one side, but especially through the glazed roof areas, which are carefully designed to prevent overheating in summer. At night or when there is insufficient daylight, the space is lit through a combination of direct and indirect light sources. Spotlights on walls and ceiling in combination with strong uplighters and large wall-mounted mirrors ensure a bright, comfortable and welcoming environment whatever the weather.

Separate access points for visitors and staff and good internal layouts keep walking distances short and facilitate smooth work processes. The patient areas are accessible directly from the atrium, with all consultation rooms located on the lower floors. The rooms are available for use by all specialist and general practitioners based at the centre. A sophisticated appointment system helps streamline the service and allocates rooms according to demand. The hospital wards are located on the quieter floors on the top three levels of the building. All patient rooms in the Orbis



Lounge areas with soft carpets, ambient lighting and comfortable furnishings offer patients and staff a place to sit and relax.

Medical Center are spacious individual rooms with en-suite bathrooms. Similar to the atrium, a combination of direct and indirect lighting offers both comfort and a pleasant ambience for the patients and functionality for hospital staff. All rooms have large sliding doors, so patients can choose to what extent they wish to take part in the general life of the ward or keep their privacy. Instead of soulless communal rooms, the generous corridors next to the rooms have been designed to accommodate cosy lounge areas with a homely atmosphere, offering a place to meet, or just to sit and relax.

A separate access at the back provides doctors and staff with their own space, away from the general public. Changing rooms in the basement connect directly to the area behind the consultation rooms, which also gives access to the integrated research and competence centre. In addition to the work spaces and attractively designed consultation rooms, this area also accommodates a separate staff canteen.

The four different zones within the Orbis Medical Center – public areas, meeting points, patient rooms and work spaces – consciously apply light and colour to have a positive effect on the users. For example, the atrium uses greens and other natural shades to create a warm, bright and friendly atmosphere, while staff work spaces use cool, refreshing colours to create a stimulating and attractive work environment.

The outside of the building, too, reflects the carefully designed zoning of its interior. The dominant façade elements are red bricks and silver-grey cladding. Technical installations are located in a recessed area on the second floor, indicated on the outside by a continuous band of glass blocks, which is lit at night. The external areas surrounding the building have also been landscaped to create a pleasant environment that promotes healing and speeds up patients' recovery.

MATERIALS: ACURO ACTIVE LED

The Acuro Active LED from TRILUX matches its light colour and temperature to the patterns of natural daylight and thereby supports our circadian rhythm. This makes it an excellent choice for all rooms that are occupied around the clock – such as in hospitals and care homes.

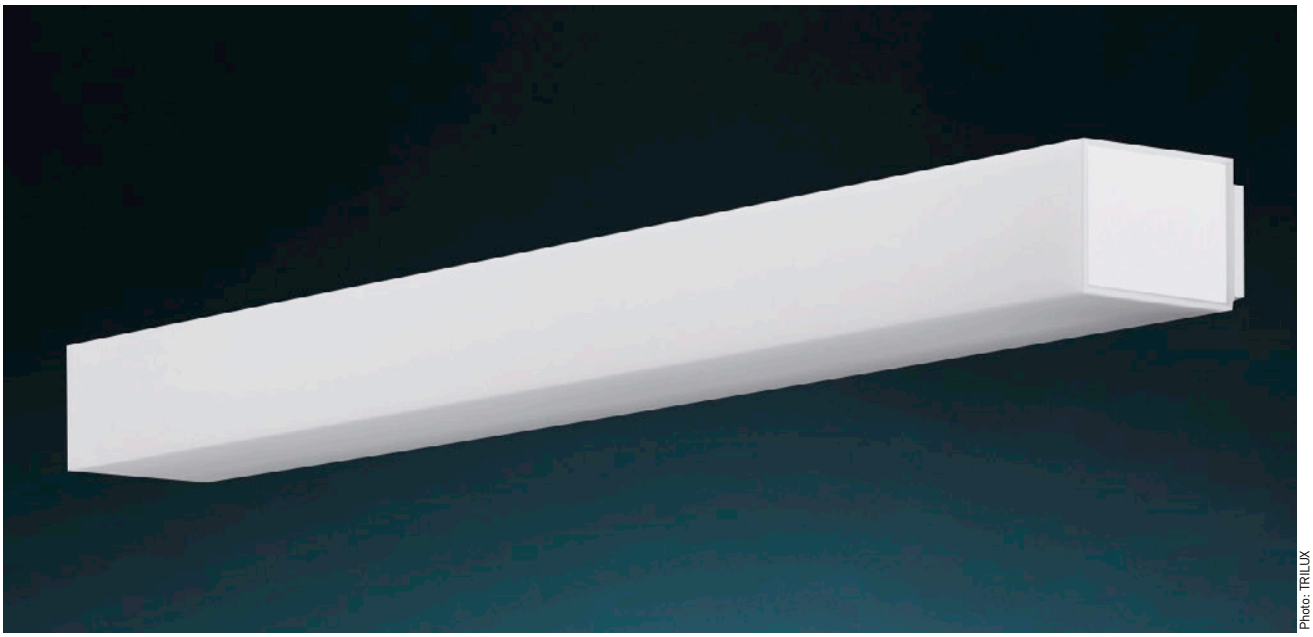


Photo: TRILUX

With the Acuro Active LED light, TRILUX has developed a luminaire that can help alleviate the negative effects that lack of natural light has on the human body clock and on our health and well-being (see also "Designer's Question"). It does this by matching the colour spectrum of natural light throughout the day. A specially developed, integrated control unit changes the light temperature from warm white (3,000 K) to daylight white (6,500 K), depending on the time of day. This way the light has a stimulating effect during the day, but is soft and gentle at night, while still safeguarding good orientation. Especially in the healthcare sector this can benefit doctors, patients and carers by balancing their circadian rhythm and compensating for lack of natural daylight. Its higher protection class IP44 also allows the Acuro Active LED to be used as a glare-free ceiling or wall light in bathrooms. Installation is easy and quick and, thanks to its flexible design, the luminaire can be mounted either vertically or horizontally. Integrated LED technology ensures a long lifespan with the additional benefit of being virtually maintenance-free.

PLANNERS ASK, MANUFACTURERS ANSWER

In the everyday work of a planner, many a question comes up which cannot be found in any handbook. Answers to such questions are given here by the experts from TRILUX who also tell you one or more tricks.

What is the significance of the circadian rhythm for human well-being and how do you work with this as a lighting manufacturer?

Thomas Kretzer
Managing director
TRILUX Vertrieb GmbH

The circadian rhythm is guided by the natural rhythm of light and darkness and determines our activity and sleep patterns.

Light regulates our waking and sleep patterns, which have evolved to match the 24-hour cycle of our environment. The circadian rhythm is what causes us to wake up when the sun rises and become sleepy as darkness falls. Responsible for this is the sleep-inducing hormone melatonin produced in the pineal gland, which is controlled by the hypothalamus. The hypothalamus responds to impulses received by non-visual photoreceptors within the eye. As a result of our busy lifestyles we spend less time in natural light during the day, but instead are exposed to artificial lighting at night. This disrupts the body's natural rhythm and can lead to sleeping disorders and serious conditions, such as depression. Good lighting should therefore follow the patterns and rhythms of natural light. Together with industry practitioners and our partners in the medical sector, TRILUX has been researching this topic for several years. One of the results, among other things, is the Acuro Active LED – an intelligent luminaire that varies its light spectrum according to the time of day, and thereby supports the circadian rhythm.

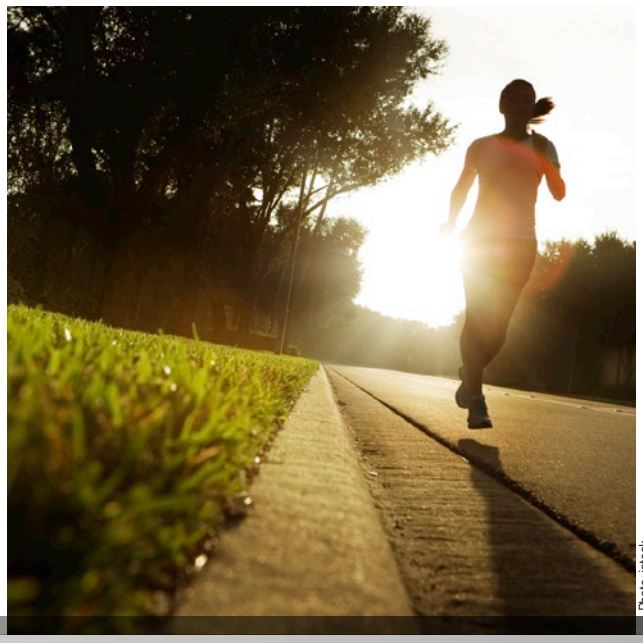


Photo: istock

MEDICAL CUBE

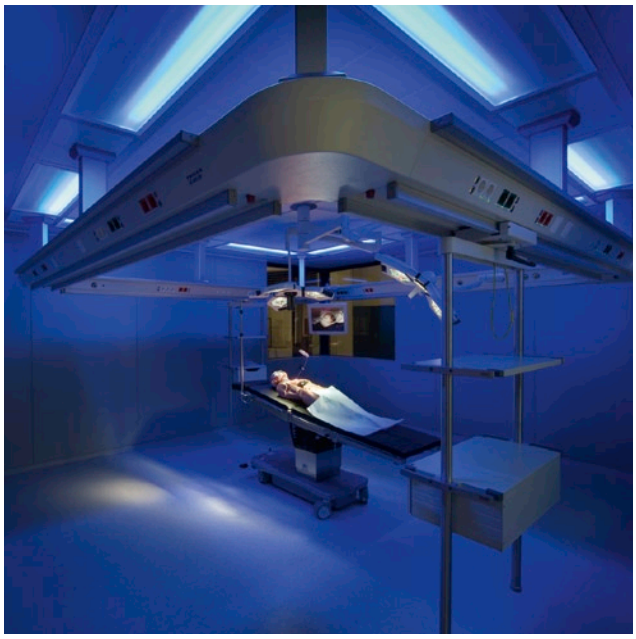
To provide a suitable platform to showcase its medical technology products, TRILUX Medical set up the Medical Cube at the company's headquarters in Arnsberg. This state-of-the-art showroom presents the latest and future innovations in medical lighting technology and enables visitors to experience their application in practice.

Lighting technology in healthcare has to fulfil a wide range of functions – from creating a pleasant and welcoming ambience in foyers and entrance zones to providing comfortable lighting in the patient rooms, all the way to highly sophisticated lighting technology in operating theatres, compliant with all the relevant standards. Therapeutic aspects of light also play an important role: from the healing and revitalising effect of natural daylight to achieving the right intensity and temperature of artificial lighting, many different factors combine to assist in recovery from illness. To showcase the great variety of lighting designs available for the healthcare sector, TRILUX have created the Medical Cube showroom, which allows designers to view and experience different lighting scenarios first hand. On the outside it is a simple, two-storey box built from steel profiles, on the inside the Cube presents the full range of lighting solutions offered by TRILUX Medical. But the Medical Cube is more than just a showroom: it also offers plenty of inspiration for designers by combining a wealth of examples for the practical application of TRILUX lighting technology. In addition to foyer and entrance areas, meeting rooms and communal spaces, the Cube includes patient rooms, a delivery room, a children's intensive care unit and several operating theatres – providing a complete and realistic portrait of hospital life.

While light is undisputedly essential for the healing process, efficient technology that brings all the different elements together is equally indispensable. In its medical lighting products, as elsewhere, TRILUX is increasingly utilising the benefits of LED technology. Individually adjustable control panels, Internet connectivity, multi-room systems and device management tools complete the picture.

As a taster, or to follow up a visit to the real thing, an interactive 3D model of the Medical Cube allows visitors to the TRILUX Medical website to take a virtual tour of the Cube without even leaving their desk.

The TRILUX Medical Cube has been equipped with innovative building automation technology using KNX/EIB, while the lighting system installed in the hospital rooms enhances well-being.



Photos: Boris Golz

TRILUX ACADEMY

With its new TRILUX Academy, the German lighting manufacturer has created a place designed to ignite passion for the subject of lighting design. The centre provides training and professional development for TRILUX staff, as well as offering seminars for professionals from other industries. The centre takes its own advice with an integrated design concept that uses light and colour to support the learning process.

The TRILUX Academy at the company's headquarters in Arnsberg opened its doors in September 2011. A state-of-the-art training centre equipped with all the latest technology, it offers training and professional development to architects, lighting designers and construction clients, as well as TRILUX employees. One- or two-day seminars on a wide range of relevant topics are held in groups of no more than 15 to 20 participants, to allow scope for interaction and individual exchange. The courses combine a traditional lecture format with discussion and experiment to support the creative dialogue.

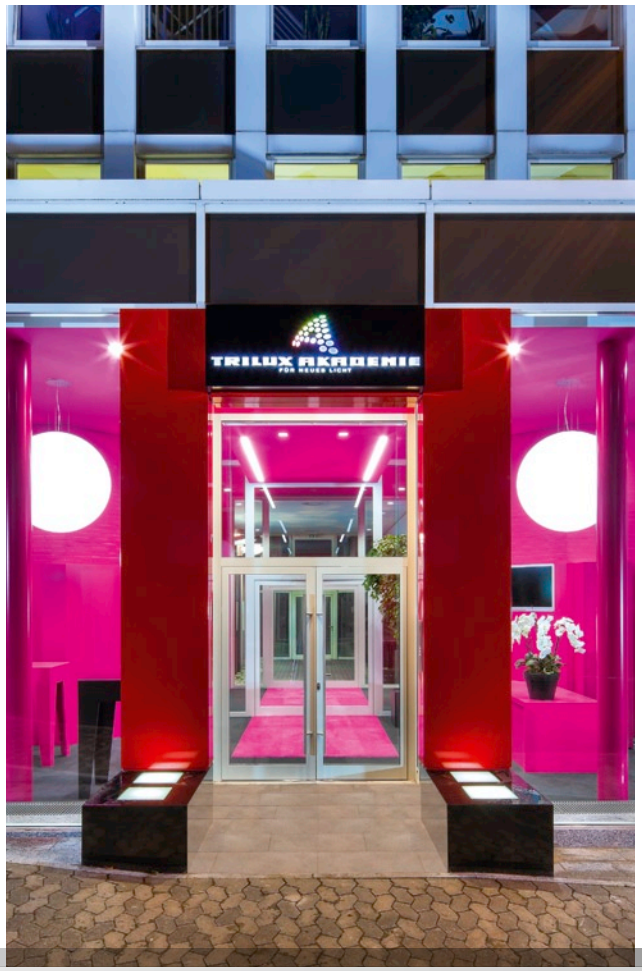
The architecture of the Academy building itself supports this interactive approach. Seminar rooms and communal spaces use colour and light to create a positive and motivating atmosphere that promotes creative thinking and aids concentration. A large plenary room for up to one hundred people, display areas for exhibitions and several smaller seminar and meeting rooms provide ample space for a comprehensive seminar programme. Two separate studios with height-adjustable ceilings offer a space to try out different products. All rooms are equipped with the latest technology and the furniture can be modified according to the individual requirements of each event. The TRILUX LightLounge complements the seminar programme, offering hands-on examples of TRILUX products in use.

Seminar topics at the Academy range from interior and exterior lighting design to industry standards and legislation to photography of light sources. Two upcoming seminars are dedicated to the subject of light in healthcare. The first one, "Light and colour in hospital design", explores the physiological effects of light and colour in promoting healing, and high-

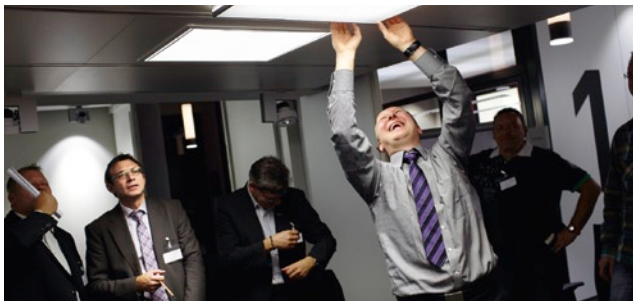
Photos: Christoph Meinschäfer

The seminar rooms offer space for groups of different sizes.

The entrance to the Academy has been designed in bright, vibrant colours.



Visitors to the Academy can try out a wide range of TRILUX products.



lights examples of best practice. This seminar takes place on 23rd and 24th February 2012 and is aimed specifically at architects, lighting designers and developers, but is also of interest to healthcare professionals and organisations. The second seminar, "Light design for dementia patients", focuses on the specific challenges in designing environments for dementia sufferers and the psychological and physiological benefits of good lighting in dementia care homes in particular, but also for elderly people in general. Seminar participants will learn how good lighting design can enhance the quality of life for dementia patients. This is a one-day seminar, taking place on 13th March 2012.

The complete and up-to-date seminar programme is available on the Academy website, together with further details about the TRILUX Academy. **www.trilux-akademie.com**

Seemingly solid shapes disintegrate and reveal a new perspective.

The "les paysages abstraits" module at the centre of the exhibition invokes a typographical landscape.

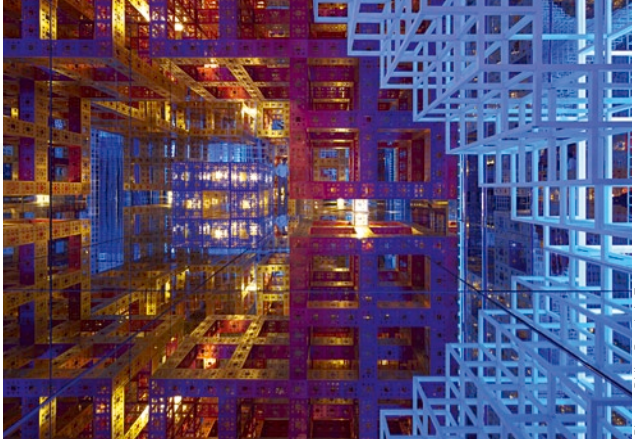
Photos: Laurence Fragnol et Adrien M/Claire B

MOVING METAPHORS

The exhibition XYZT by the French duo Adrien M and Claire B takes visitors on a fantastical journey of interactive, ephemeral metaphor where the viewers themselves become the performers.

By Stefan Staehle

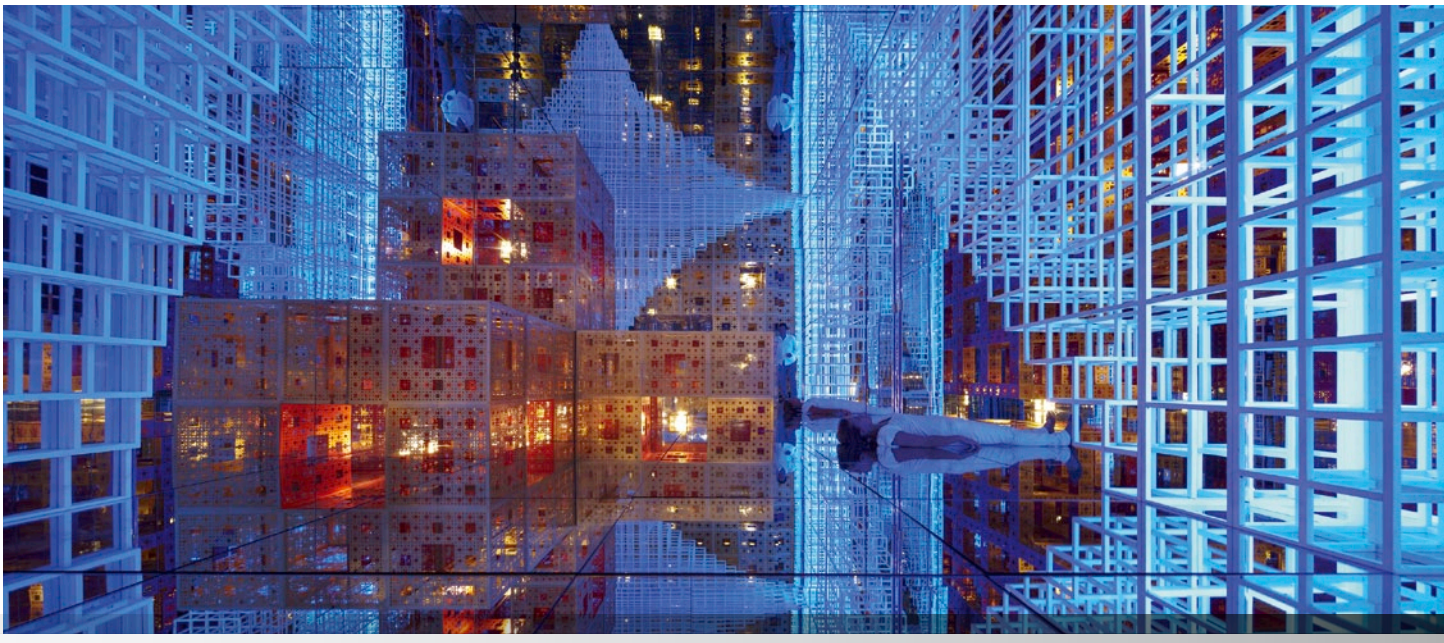
Since his artistic breakthrough, Adrien Mondot has been working to dissolve the boundaries between technology and the human body and to bring about a complete fusion between both. With this exhibition, he and his partner Claire Bardainne have created an interactive, digital chamber of wonders, taking him one step closer to this goal. The merging of three-dimensional space, symbolised by the coordinates XYZ, with the transient factor of time (T) is the idea behind this exhibition. In a darkened room, six video installations confront the visitor with "mathematical paradoxes, typographic illusions and metaphors in motion". The video modules consist of three contemplative and three interactive elements, engaging the viewer through movement: using your hands or your whole body you can conjure up lines, circles, letters or whole words out of light and movement, creating your own mysterious, dream-like parallel universe. **www.am-cb.net**



The intricate maze of nested cubes resembles computer-generated imagery

Photos: Didier Boy de la Tour

Inside the "Beyond Infinity" installation the only indication of up and down comes from your body's own gravity.

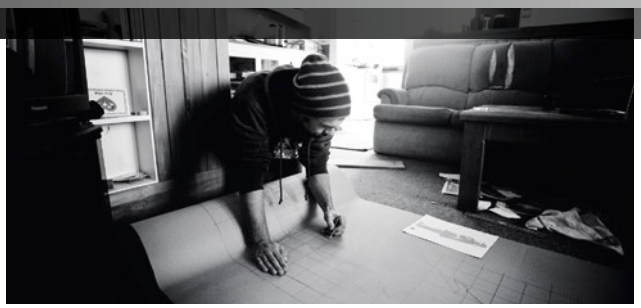


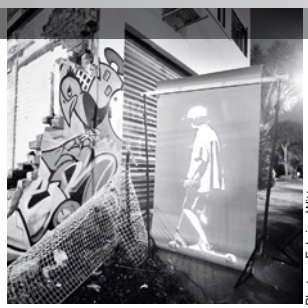
INFINITE SPACE

The artist Serge Salat plunges the visitor into an illusory environment, an infinite maze of endlessly multiplied rooms, using imagery inspired by virtual reality.

By Sarah Centgraf

The installation "Beyond Infinity" by French artist Serge Salat is like a space-distorting dream world: a clearly defined closed entity from the outside, its interior confounds our spatial perception. The traditional geometry of length, width and height becomes blurred as endless reiterations of perforated cubes obscure spatial constraints. Covered in its entirety in mirrors, the room seems to expand with the interplay of light and shadow. As you wander through this space, a cycle of light recreates the natural rhythm of night and day, lighting up the grid structure in the red and golden glow of sunrise. Next it illuminates an enormous cross as the central object, before completing its cycle on a vast cube in the deep-blue colours of the evening sky. With this installation, in particular the image of the cross as a Christian symbol, combined with the ritual-like movement through the space, the artist consciously bridges Western and Far-Eastern cultures, evoking a spiritual architecture. **www.urbanmorphologylab.com**





Photos: Fabrice Wittner

Elaborate preparations: the artist Fabrice Wittner created life-size cardboard stencils from photographs he took of the people of Christchurch. The stencils were then placed in various locations throughout the town and lit up to be re-photographed.

The silhouette of a construction worker in front of a destroyed house – like a beacon of light in the darkness. Original photos of people from Christchurch served as templates for the life-size cardboard cut-outs the artist Fabrice Wittner used as light stencils.

ARTISTIC AFTER-SHOCK

The project "Enlightened Souls" by the French photographer Fabrice Wittner brings different art genres together in a powerful symbol of remembrance

By Johanna Niescken

When, on 22nd of February 2011, a strong earthquake shook New Zealand, Christchurch on the east coast of the South Island was one of the places most badly affected. 181 people died in Christchurch alone. The devastation was so severe that some parts of the city were going to be abandoned completely. Nevertheless, soon after the tragedy, people went about rebuilding their destroyed inner city. It was during this time that the photographer Fabrice Wittner came to Christchurch to make a documentary about the earthquake. He talked to the people he met and took photos of them at work or on their way home, as they gradually returned to their normal lives. Impressed by their stoicism, the artist wanted to portray more than just the aftermath of the earthquake. Using his photographs as templates, he made life-size cardboard stencils of individuals, which he illuminated and re-photographed amidst the rubble, creating luminous holograms that pay tribute to the devastation as well as the rebuilding effort afterwards – an artistic homage to the unwavering courage of those affected. www.wittner-fabrice.com

Using simple wooden frames, white overalls and LED lights, Luzinterruptus have created a poignant installation.

A static army of "inspectors" symbolises the paralytic shock the world experienced in the face of the radiation threat.

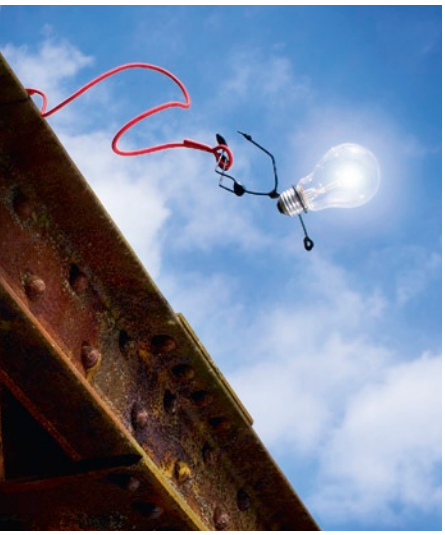
Photos: Gustavo Sanabria

RADIANT LEGION

"Does the presence of radiation inspectors worry you?" – this is the question the artists group Luzinterruptus poses with its installation "Radioactive Control", in which one hundred illuminated figures commemorate the nuclear disaster in Japan.

By Franziska Bettac

The anonymous artists group Luzinterruptus from Madrid reflects on the global paranoia in the aftermath of the nuclear disaster in Fukushima – and the speed at which the topic disappeared from the headlines soon after. Invited to contribute one of their "interventions" at Hamburg's alternative music and arts festival Dockville, the group created an installation that alludes to the events in Japan. For 30 days, one hundred human shapes, all in identical clothes and posture, were placed in a field near the art camp. At dusk these "inspectors" started to glow as dozens of tiny LED lights lit up inside them, conjuring up images of radioactive contamination. Slightly stooped forward, the figures resemble remorseful penitents – or an army of synchronised soldiers marching menacingly towards the city. With the installation, Luzinterruptus want to give a face to the ongoing (though often denied) threat and ask: "Will we soon have to live with constant monitoring?" **www.luzinterruptus.com**



Photos: Fabrice Wittner/Rapsodia

HEUREKA!

By Sandrine Nsoga/Marina Schiemenz

How do you physically represent an "idea" as such? This is the question the photographer Fabrice Wittner asked himself and decided to personify "the idea" in the form of a bright little chap, he called "Idea Boy". Taking inspiration from Walt Disney comics, the artist used simple wire and a light bulb to recreate his childhood hero: inventor Gyro Gearloose's "Little Helper". With Idea Boy, the photographer, whose work largely revolves around the extreme sports scene, explores the constant search for ever-new thrills in combination with the rapid technological development in this field. The result is a photo series that shows Idea Boy on expeditions and sporting adventures, such as bungee and base jumping, free climbing, Nordic walking or even just playing boules. Now there's a bright idea! **www.wittner-fabrice.com**

VIEW OF THE INSIDE

In the deserted rooms of Würzburg's Julius Maximilian University, in the late afternoon of Friday the 8th November 1895, the physicist Wilhelm Konrad Röntgen made a discovery that was to revolutionise medicine. It must have been quite eerie – realising that the rays he was experimenting with made it possible, for the first time in history, to look inside the human body without the need for surgery. Only Röntgen's determination and painstaking research have made the technology of diagnostic radiology available to us today.

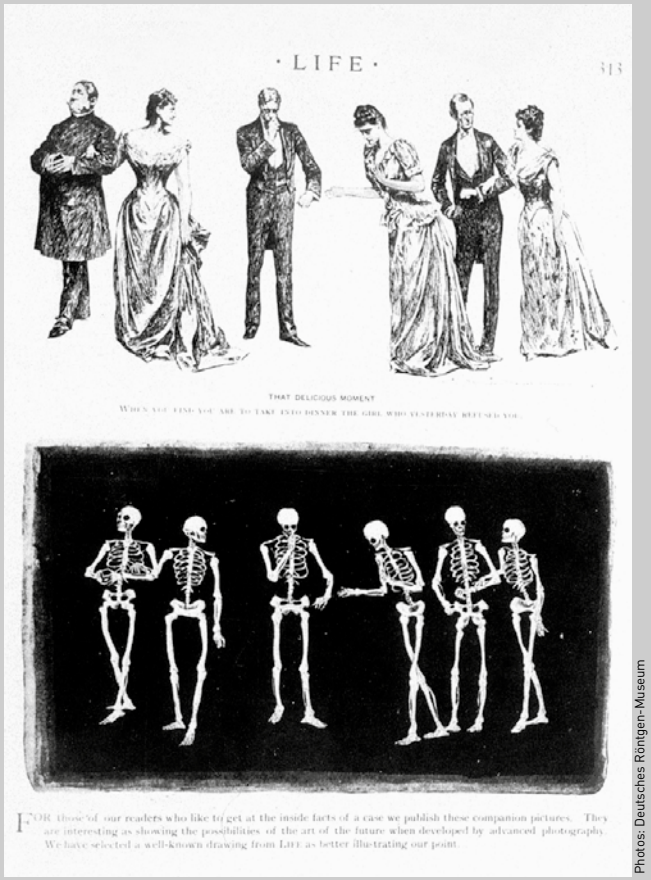
Röntgen was experimenting with a cathode ray tube, initially using the "X-rays", as he named his discovery, to examine various objects in his laboratory. He mentioned his discovery to no one, not even his wife, until he was certain that it would stand up to scrutiny. Only once he had gathered sufficient scientific evidence did he present his discovery to the world. In early 1896, he sent an X-ray image of his wife's hand to friends and acquaintances as a New Year's card. The news spread fast and caused much excitement, as doctors and scientists quickly recognised its enormous potential. Keen to allow mankind as a whole to benefit from its practical applications, Röntgen even refused to register patent rights for his discovery.

In high society, too, Röntgen's discovery caused much delight. In ignorance of its dangers, X-ray photographs became highly fashionable: as a party gag, photos were taken of guests' skeletons, and in shoe shops X-ray images of customers' feet were used to establish a good fit for their new shoes.

In 1901, Wilhelm Konrad Röntgen was awarded the first ever Nobel Prize in Physics. To this day, X-rays remain indispensable in medical diagnosis and forensics, as well as in archaeology and art history.

Greeting card with an X-ray image of Röntgen's wife's hand (below left).

Cartoon illustrating the casual use of X-rays in the late 19th century. From Life magazine, 6th April 1896 (below).



Photos: Deutsches Röntgen-Museum

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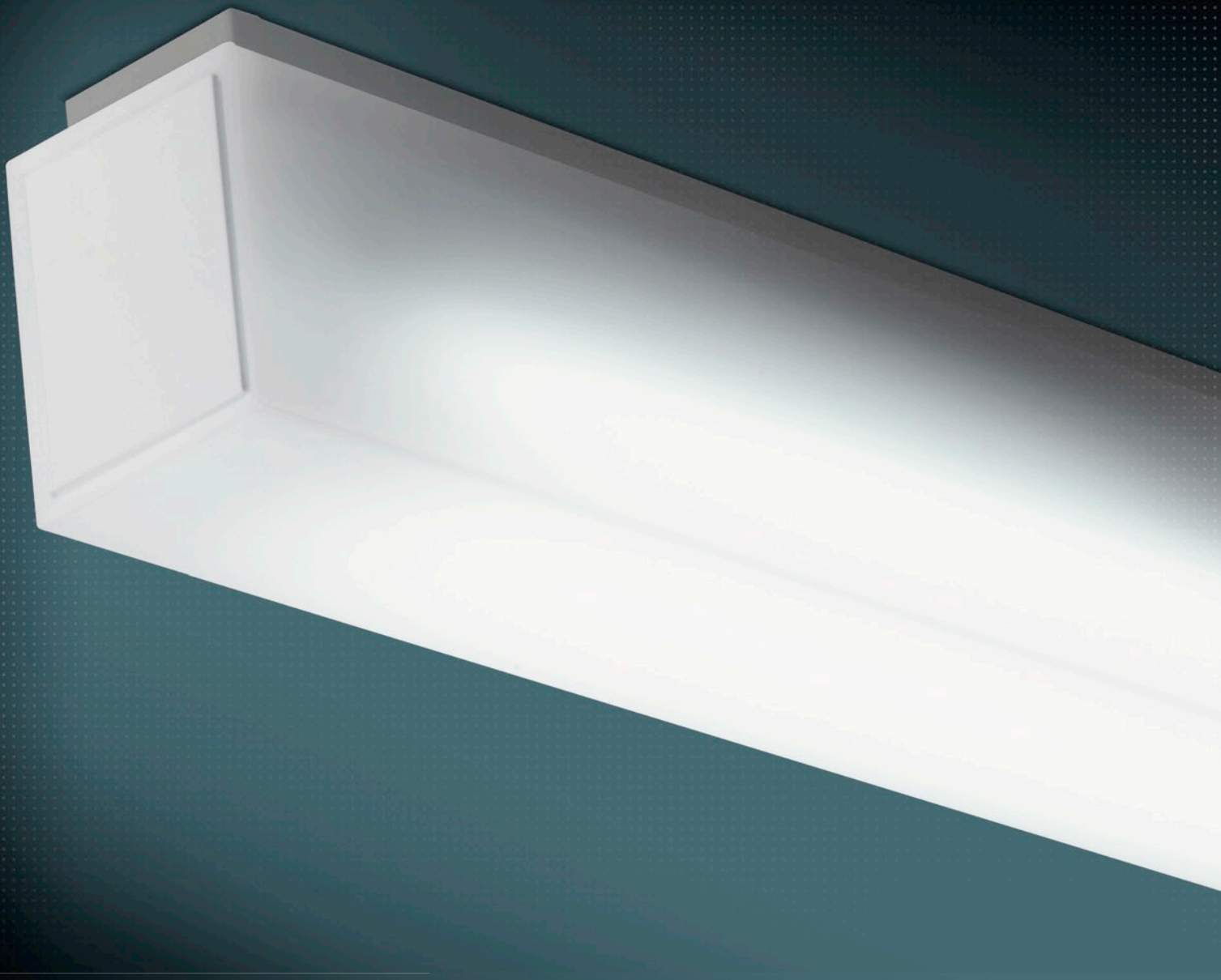
Isn't LED light cold and blue?



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